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COMPUTATION OF INSTRUCTOR REQUIREMENTS
FOR ANY SERVICE SCHOOL

[illegible]

A THESIS
SUBMITTED TO THE
SCHOOL OF EDUCATION AND
THE COMMITTEE ON GRADUATE STUDY
OF
LELAND STANFORD JUNIOR UNIVERSITY
IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS
FOR THE DEGREE
OF
MASTER OF ARTS

By
Gerald E. Miller
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CHAPTER I

INTRODUCTION

Background

The Armed Services have committed themselves to the operation of formalized training establishments. Prior to World War II, such formalized schools were limited in number and scope. The tremendous advances in the development of technical equipment which that war produced, have prevented the services from ever returning to their pre-war methods of training technicians to operate and maintain that equipment. The apprenticeship method of training is out. On-the-job training cannot produce technicians of the proper quality fast enough to meet service needs. Formalized service schools are here to stay, and all of the problems which they encounter also are with us. The establishment, operation, administration, and evaluation of these schools must be performed by service personnel with limited advisory assistance from civilian sources.

To accomplish this mission, large training sections have been established in the various bureaus involved. Training centers have been set up with personnel and equipment to teach all of the complicated phases which go into the make-up of a competent technician. These centers are

comparable in size to many of our larger universities, but they are not comparable in their method of instruction.

It is imperative that service school administrative and instructional personnel keep abreast of latest operating techniques and procedures, in order that the material presented in the service schools will be correlated closely with the needs of the operating forces. This fundamental requirement prohibits the establishment of a professional training corps in the services. No one group of military personnel can devote their careers to the profession of formalized training. As a result, the services have adopted a method of instruction which is comparable to the assembly-line method of construction in a modern automobile or airplane factory. This unique method has eliminated many of the age-old problems of the educational profession, but at the same time, it has created many new problems. Tools for the solution of these new problems are needed. This study was made to assist in the development of one tool necessary for the solution of the instructor requirement problem.

The Problem

The decision as to whether or not a formalized school is needed to teach the mechanics of some technical specialty, is made by top military management. Furthermore, changes in the nature and scope of the material being taught are dictated by such management. For intelligent decisions in these matters, close liaison must be maintained between training management, research divisions, and the operating forces. It is not enough that a technician understand the fundamentals of his specialty. He must be trained, and re-trained in the newest developments and keep pace with the advancements which the operating forces and research divisions elect to implement. The equipment is no better than the personnel by which it is operated and maintained.

The number of technicians of certain specialties which will be needed to meet the requirements of the operating forces also is determined by top management. Compensations for normal losses must be made. Re-training for advanced work must be accomplished. Fluctuations in the strength of the operating forces to keep pace with the dictates of the public present a factor for which compensation in the training load must be made. The size of the student body of the service schools is determined by the conclusions reached during this phase of top management operation.

Other decisions which top management must make are those concerned with the physical location of the training plant, the amount of time which can economically be devoted

to training, and the size of the school administrative force.

The final decision which top management must make relative to the training program is concerned with the size of the instructional force, the number of teachers or instructors which will be required to do the job. At present, methods and techniques for arriving at an intelligent decision on this matter are crude at best. Thumb rules based on studies of teacher load problems in civilian schools often are used, even though the methods of instruction for civilian and service training establishments are totally different. Frequently, and in the customary service manner, reliance on what was done in the past is the criterion for determination of the size of the instructional force. Recommendations from the school level and the supporting staff level are sometimes requested, but personnel at these working levels are unable to make intelligent recommendations because they have no tool with which to make their measurement. No flexible yardstick is available which will compensate for all the variables in the instructor requirement problem. The problem is then to develop such a yardstick, one which will compensate for all of the variables involved, and be capable of use by all of the levels of service school management.

Need for the Study

For lack of accurate measuring devices to determine the instructor needs for service schools, considerable

waste of manpower and money has been created. The decision of top management to instigate a large new training program, or to expand one already in existence, without having an accurate account of the size of the instructional force required, has resulted in situations where the student load must sit and wait at out-of-the-way bases while an instructional force is mobilized. Sometimes, the number of instructors required exceeds the number which are available in the service. The consequence is wasted time and money. As a matter of fact, if top management could accurately determine instructor needs, it is quite possible that some large training programs would be completely cancelled at their inception because of the manpower cost involved.

Conversely, when a decision is made to reduce the size of the student body, the exact nature of the accompanying cut in the size of the instructional staff cannot be made intelligently. If too large a cut is made, or made in the wrong place, the standard of instruction in the remaining school plant is jeopardized. If too small a cut is made, again there is wasted time and money.

Perhaps the greatest contribution of such a yardstick, however, would be the provision of a common meeting ground for top management, staff functionaries, and school administrators in the determination of instructor requirements. The present practice of top management in requiring school and staff levels to justify the size of their instructional staffs, forces these personnel to

take much valuable time away from their primary duties, namely the administration of technical training. A common yardstick, by which all parties agree to abide and which could be used for planning purposes, would do much to increase the standard of instruction in the service schools. Slide rule personnel planning and thumb rule student/instructor ratios as used by top management, cannot account for all of the variables involved. The practice by school administrators of recommending the assignment of more instructional personnel than needed just to insure that they will have enough to do the job, also prohibits an intelligent solution. Neither practice advances harmony and cooperation between the two groups, and the standard of instruction is certainly dependent on the degree of cooperation between top management and the school level. A flexible yardstick must be evolved, and this yardstick must be agreeable to all factions concerned with the training program.

Perhaps one of the best discussions concerning the need for such a yardstick is contained in a report of a survey of the educational program of the Adjutant General's School, Camp Lee, Virginia.[1] The survey commission observed that a yardstick based on a ratio of instructors to students does not appear to be valid, because it does not correlate with how an instructor uses his time during

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1. The Adjutant General's Office, "Survey of the Educational Program - The Adjutant General's School - Camp Lee, Virginia," pp. II-5.

an ordinary work day or work week. In educational practice, the size of classes is limited because of considerations relating to effectiveness of teaching, not by the number of instructors available to teach. The commission therefore concluded that a yardstick of one instructor per any number of students is unrealistic, and that in fact, there are no valid yardsticks established as yet to determine how many persons should be employed in situations demanding creative work. Even with the method of instruction used in service schools, there is certainly a great amount of creative work required by the instructor. The commission then recommended: "That a more practical and realistic yardstick be determined for estimating the needs for instructional personnel at the School and that requests for additional instructional personnel to meet emergency situations be evaluated in terms of the justifications submitted even if the request exceeds the established personnel ceiling."[1]

Objectives of the Study

In view of the discussion presented above, this study is concerned with three objectives. The first is to present a detailed description and analysis of the instructor requirement problem. All of the elements and variables which make up this problem have been analyzed, with a view towards showing their significance and effect in computing the number of instructors required for any service school.

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1. *Ibid.*, p. 36.

The second objective is to establish certain standards for use in computing instructor requirements. An effort has been made to determine existing conditions of instructor load and also to determine what should constitute a standard load. Opinions of instructors, administrators, and supervisors have been analyzed, combined with results of previous related studies, and presented as the best estimates of the situation.

The third objective of the study is to present a technique for computing instructor requirements. It is offered as a flexible yardstick for measuring the instructor requirements, a tool to assist in the solution of the instructor requirement problem.

Procedure Used in Making the Study

In order to gain the necessary data for this study, three separate questionnaires were prepared. The first was administered to instructor personnel, the second to service school supervisors, and the third to service school administrative personnel. The results of several of the answers on these questionnaires were analyzed and used to supply statistical supporting material to the analysis and discussion of the instructor problem, the first objective. Interviews with instructors and administrative personnel of the Naval Air Technical Training Command, Memphis, Tennessee were also used in developing this phase. Information gained from visits to three Air Force training bases was helpful.

Data for arriving at the standards derived in the second objective were supplied principally by an analysis of the results of answers to the questionnaires, although certain relative material from previous related studies also has been used.

The basic idea for the yardstick presented in the third objective originated with members of the Staff of the Chief of Naval Air Technical Training, Memphis, Tennessee. Changes to the original technique are recommended in this study as a result of the standards derived.

Although all information contained in the study is applicable to any type of school utilizing the method of instruction practiced by service technical schools, all experimentation has been confined to personnel of the Naval Air Technical Training Center, Memphis, Tennessee and to members of the Staff of the Chief of Naval Air Technical Training, Memphis, Tennessee. As will be indicated later in the study, the Center at Memphis is of sufficient size and embodies such a variety of service schools, that it is very suitable for experimentation of the type used in this study. Two personal visits were made to the Center and the cooperation received was of immeasurable help. The need for a suitable technique for the measurement of instructor requirements has long been recognized among personnel of the entire Naval Air Technical Training Command and their efforts and research relative to the problem are really the background for the work done in this study.

Delimitations of the Study

This study has been confined to the problem of instructor requirements only, the term "instructor" in this case to include supervisors of instructors. No attempt has been made at any time to establish standards for the determination of the size of the administrative or support force required by a service school. Furthermore, all data are related to the broad field of service schools. Only in a few instances is any confined to specific types of schools.

Definitions

Instructor -- a person actually engaged in teaching others. It does not include school administrators or supervisors of instructors, except as noted above. Instructor is ordinarily used in the services in preference to the word "teacher."

Instructor requirements -- this term refers to the number of instructors and instructor supervisors required to perform a certain task. It includes the supervisors of instructors but does not include any administrative personnel.

Supervisor -- a person charged with the responsibility of supervising the performance of a group of instructors. He may or may not act in an instructor capacity but almost invariably has had considerable instructing experience before being designated as a supervisor. He is not considered to be in the school administrative force although some of his duties may be of an administrative nature.

School Administrator -- a person charged with some administrative responsibility for the operation of a service school. He is usually in charge of a school or acting as an assistant or adviser to the officer in charge. He is not a clerical assistant or member of the maintenance force of the school.

Curriculum -- all training, both military and technical, taught within an individual school.

Curriculum Outline -- an outline of all that is taught in the individual school. It is basic in nature, and by no means complete in detail. It is the skeletal structure around which the course of study is built.

Course of Study -- a comprehensive outline for directing the thinking, planning, and experiences of the trainees in a given study. It shows, in detail, the scope and proper teaching sequence of all practical work, jobs, and related information to be covered in a training course. It is an enlarged version of the curriculum outline and contains the same basic material, differing only in organization and completeness of detail. The Course of Study is broken down into phases, each phase being broken down into the individual lessons.

Phase and Unit Instruction -- indoctrination of the new instructor on the material contained in a phase or particular unit within a phase of the course of study. Normally an instructor is responsible for learning and teaching the material contained in only one or two units within a phase.

Service School -- any school of the armed services which employs the phase-unit technique of presenting material to the trainee.

Classroom Lecture Instruction -- that type of instruction whereby the instructor explains theory or conducts a demonstration using the lecture or conference technique.

Lab, Shop, Line, Field or Flight Instruction -- that type of instruction whereby the student does the work by practical application and the instructor merely supervises or directs the effort with instruction being confined to individuals or small groups. Lab or shop instruction is conducted in a regular experimental laboratory or work shop. Line instruction is conducted on an aircraft line where planes are parked in a line simulating actual operating conditions. Field instruction refers to instruction on rifle, pistol, skeet and trap ranges, etc. Flight instruction refers to instruction given in flying classrooms.

Navy School Types -- Information for this study was obtained from the following types of U.S. Navy schools.

Class "P" Schools - designed to conduct training at a preparatory level. Their main function is concerned with personnel career guidance.

Class "A" Schools - designed to cover basic material for qualification as Third Class Petty Officer.

Class "B" Schools - designed to cover material for higher petty officer ratings.

Class "C" Schools - designed to cover material necessary for a particular qualification or skill which is not

included in the general material required for higher petty officer ratings.

Officer Schools -- designed to train officers in particular technical specialties. Instructors in these schools may be officers or enlisted personnel.

Factory Training -- special courses set up in manufacturing plants and factories to present material relative to a particular piece of technical equipment manufactured by that plant or factory.

Fleet Duty -- service in the operating forces.

Instructional Day -- the number of hours in a day during which the instructor is actually engaged in presenting material to the students. Either class or lab instruction may be used.

Instructional week -- the number of hours in a week during which the instructor is actually engaged in presenting material to the students.

CHAPTER II

ANALYSIS OF THE PROBLEM

General

In order to understand fully the problem involved in computing instructor requirements, it is first necessary to examine the technique used by service schools in presenting the material to the student. It is then necessary to study the administrative conditions under which such schools are required to operate.

Service School Instructional Technique

Because of the highly technical nature of most of the material presented in a service school, and since the services cannot maintain a professional teacher corps, a unique technique has been devised for presenting the material to the student. The system resembles that used by a modern industrial concern in the manufacture of automobiles or aircraft. A master assembly line is set up and the student is the raw material introduced at the beginning of the line. The end product is the graduate student who supposedly has absorbed all of the material which has been presented to him as he progressed along the master assembly line.

As with any industrial process, the quality and nature of the end product is decided upon first. A

curriculum is chosen which will manufacture the desired product. This curriculum is usually decided upon by top management when it becomes apparent that personnel must be prepared for some particular specialty. It is outlined so that it will contain all that is intended to be taught in the school, responsibility for the preparation of the outline being delegated usually to a staff functionary in the chain of command. It ordinarily contains such information as the length of the course, the time devoted to technical training, the time devoted to supplementary training, the subjects with time allocated thereto, explanations needed to clarify the above, objectives of the course, qualifications for entrance, phases and time to be devoted to each, and an outline of the material to be covered in each phase. Final approval of the outline is usually accomplished by top management.

The curriculum outline is then delivered to school level personnel for the development of the course of study. This study shows in detail, the scope and proper teaching sequence of all practical work, jobs, and related information to be covered in the training course. First, it is broken down into phases, then into units, and finally into lessons, the latter being the basic element of the instructional plan.

The lesson indicates the time to be allocated thereto, an outline of the material to be covered, the texts and reference books to be used, the operations and related

information to be learned, the skills to be developed, the instructional aids to be employed, and the homestudy assignments necessary.[1]

The course of study then serves as the master plan for the layout of the assembly line. Each phase is laid out in its proper sequence, each unit within a phase is arranged according to the master plan, and each lesson within a unit is laid out to provide a proper assembly pattern.

As the student goes through the line, the material from each lesson is presented at the proper time until the first unit is completed. Then the second unit is placed on top of the first and so on until a complete phase has been developed. Other phases are similarly added in proper sequence until the entire course of study has been covered. The end product has received all material in the proper order.

This method of curriculum and course of study development is certainly not much different from that used in any conventional school system. What makes the service school technique unique however, is the fact that in most cases no instructor presents all of the material in the course. On the contrary, each instructor is thoroughly indoctrinated on the material in a limited number of phases and presents only that material to the student.

In response to a question on this subject, instructors at the Naval Air Technical Training Center, Memphis,

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[1] Material for the description of the curriculum and course of study was taken from Air Technical Training Instruction [illegible] dated [illegible] January [illegible] as promulgated by the Chief of Naval Air Technical Training, Memphis, Tenn.

Tennessee gave answers as indicated in Figure 1, showing that of those using this technique, over 40 percent were responsible for material in less than one phase of the course of study.[1] The number of days required to complete the longest and shortest phases or units which the individual instructor teaches is shown in Figure 2, indicating that in the majority of cases, less than seven days are required to complete the scope of material for which any one instructor is responsible.

Thus it can be seen that service schools have compensated for their lack of professional career teachers and the technical nature of the subjects, by limiting the material for which an instructor is responsible to the amount that he can master adequately and present satisfactorily. Each instructor presents just that amount of material for which he is responsible as the student progresses through the school. The student will have as many instructors for the course as there are unit breakdowns of the course of study.

The course of study contains specified numbers of hours of instruction using the lecture or conference method of instruction. There are hours specified for laboratory or shop instruction, for instruction on the line, in the field, or in flying classrooms. In all cases, the same

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1. A complete description of the details involved in administering the questionnaires to personnel in Memphis will be given in Chap. IV. Certain material from the questionnaires will be used in this Chap. in order to furnish necessary data to fully describe and analyze the instructor requirement problem.

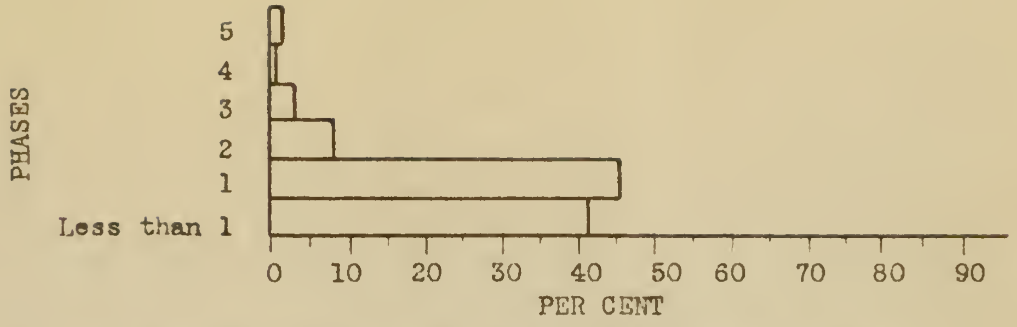

FIGURE 1. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF PHASES TAUGHT BY EACH INSTRUCTOR

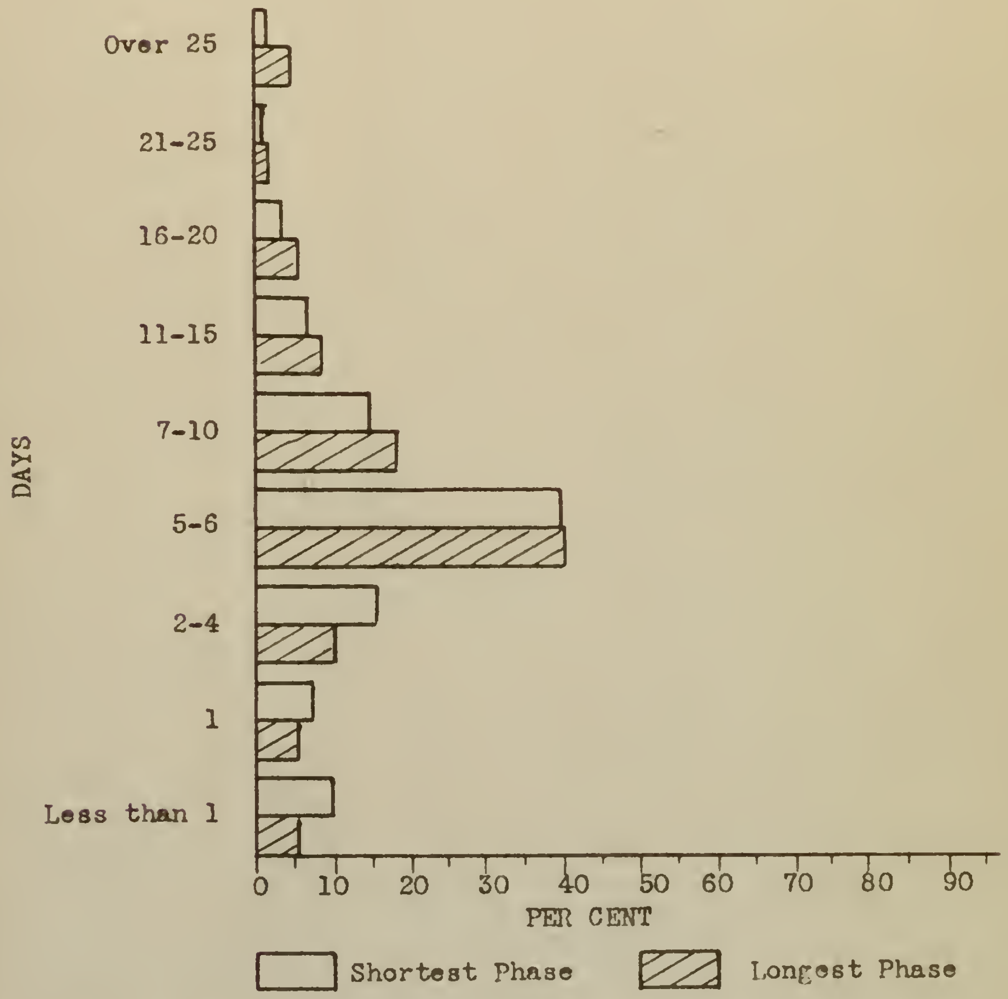

FIGURE 2. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF DAYS REQUIRED TO COMPLETE SHORTEST AND LONGEST PHASE TAUGHT BY EACH INSTRUCTOR

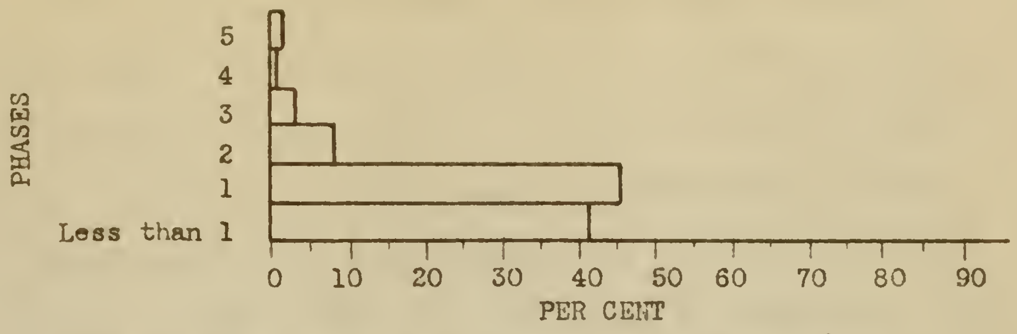

FIGURE 1. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF PHASES TAUGHT BY EACH INSTRUCTOR

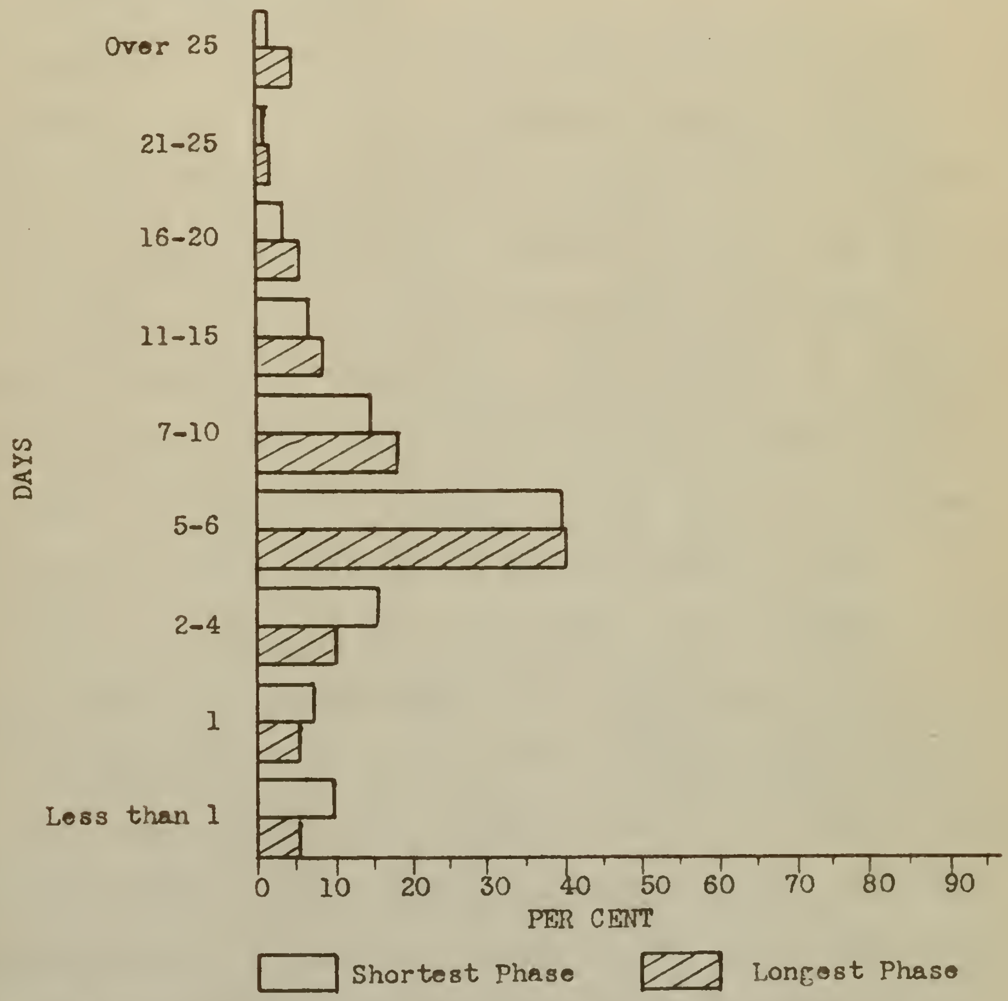

FIGURE 2. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF DAYS REQUIRED TO COMPLETE SHORTEST AND LONGEST PHASE TAUGHT BY EACH INSTRUCTOR

assembly line method of presenting the material is used. This unique method has a very definite effect on any system which is devised for computing instructor requirements for a service school. If the length of the course is increased, more instructors are required to teach the additional units. If the length of the course is decreased, and some units are eliminated, there are extra instructors. This method of instructing is the first element of the instructor problem which must be considered.

The Size of the Student Body

The number of students who will enter the front end of the assembly line is usually determined by top management. The size of the quota that is assigned to each class determines the total student body for any school, and the number of students in the school most definitely affects the number of instructors required. This problem in technical or vocational schools is additionally aggravated by the fact that the number of students which any one instructor can teach is often determined by the nature of the material being presented. In some cases, the material can be presented in lecture form with large numbers of students assigned to each instructor. In other cases however, in the same school, the material may be so complicated and intricate that no more than one student can be assigned to each instructor. Failure to realize this fact seems to be one of the major oversights on the part of top management in their concept of the number of instructors required to operate a service school. Student/instructor

ratios of one to one are expensive but for some units or phases of instruction they are essential in order to produce the technician desired.

Another catch in the student quota element of the problem which further complicates the situation, is the fluctuation in the size of the quotas. If the input quota for individual schools is maintained at a constant figure for long periods of time, a stabilized student load and better instruction are the results. However, with the constantly changing numerical strength of service man-power, stabilized quotas are not to be found very often. For example, the data illustrated in Figure 3 show the fluctuations in student load for one school, indicating that the size of the student body varied from 500 to 1130 and back to 400 in twelve months of time. The rate of variation was fairly constant in this school, however, while the data in Figure 4 show that frequently, the rates of change are extreme. The data illustrated in Figure 5 show that one service school command of thirty-three schools lost 3000 students between January and December.[1] The probable answer to this problem is to stabilize quotas as much as practicable but since this seems to be impossible, allowance for these fluctuations must be made in any technique used in computing instructor requirements.

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1. Information for Figures 3, 4, and 5 was taken from monthly statistical reports of the Naval Air Technical Training Command for the months of January through December 1949.

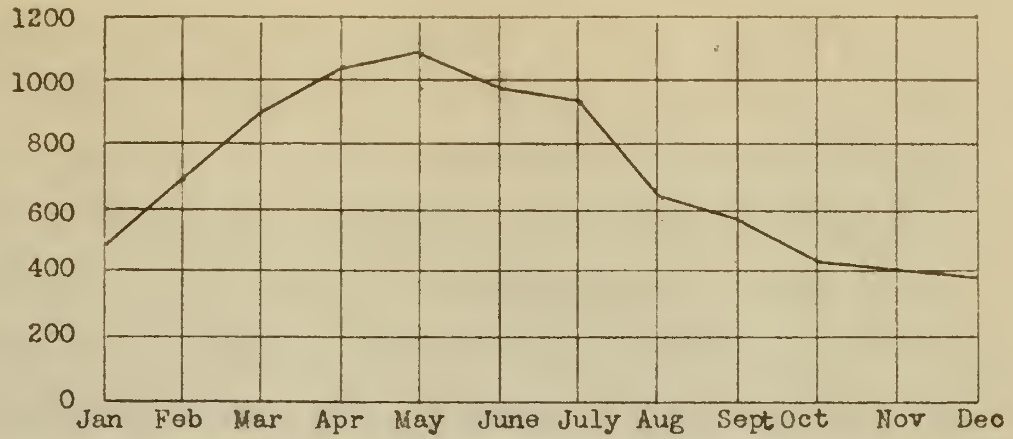

FIGURE 3. STUDENT LOAD FOR THE AVIATION MACHINIST MATES SCHOOL (CLASS "A"), NATTC, MEMPHIS, TENN., CALENDAR YEAR 1949

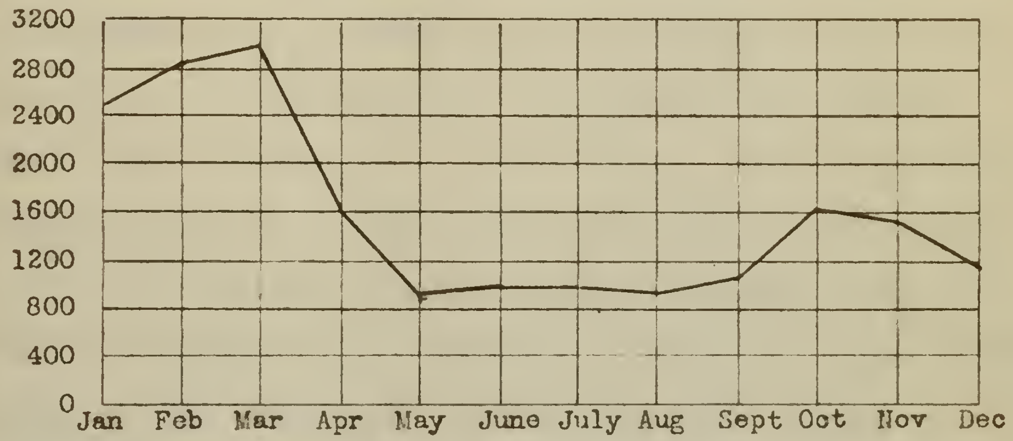

FIGURE 4. STUDENT LOAD FOR THE AIRMAN SCHOOL (CLASS "P"), NATTC, MEMPHIS, TENN., CALENDAR YEAR 1949

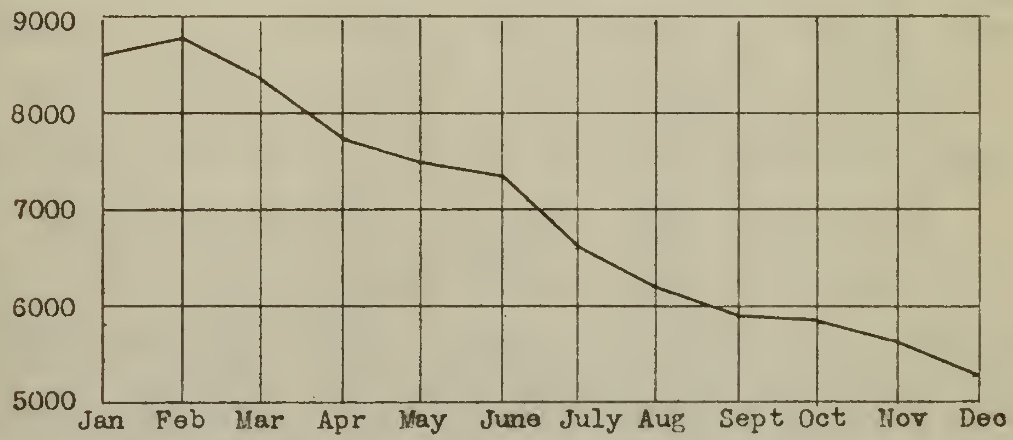

FIGURE 5. COMBINED STUDENT LOAD FOR ALL SCHOOLS OF THE NAVAL AIR TECHNICAL TRAINING COMMAND, CALENDAR YEAR 1949

Frequency of Input of Students

Unlike the conventional civilian school, which does not start a new class until the old one has completed the course of instruction, many service schools operate on a continuous basis, just as the automobile assembly line. New classes are started while previous classes still are undergoing instruction in the course. Some schools convene a new class every week, others once every two weeks, or once a month, or on designated dates in a month. The exact frequency is determined by top management and is dependent upon the availability of students, nature of the course, or the convenience of the school. Thus in a school having a course of instruction that is sixteen weeks long, it is possible to have sixteen different classes under instruction at one time if a new class is convened once a week. The assembly line technique of presenting the material is the factor which makes this feature possible and is one of the few advantages of the system. However, the frequency of convening new classes has a definite effect on the number of instructors required. The more frequent the convening dates, the fewer the units that one instructor can teach. Consequently more instructors will be required.

It is not to be assumed, however, that the less frequent the convening of new classes, the fewer the instructors who will be required. If new classes are not convened often enough, some instructors who are qualified to teach only a small section of the course, will find themselves sitting with nothing to do for one, two, or more weeks, waiting

for the next class to come along and receive the material which they are qualified to present. This policy naturally wasted time and money, but if the instructor is incapable of taking on a bigger section of the course, either through inexperience or inability, a decrease in the number of instructors required will not be obtained. In figure 6, an indication of this problem is shown, in that over 20 percent of the instructors in the Memphis schools do not teach on a continuous basis. It may well be that their non-instructing time is well occupied, but nevertheless, there are some weeks when instructors have no classes at all.

Thus it can be seen that this factor of frequency of input must be considered when computing instructor requirements for any school.

The Instructor

Fox, Bish, and Ruffner have pointed out that "the classroom teacher is the most important member of the school staff."[1] It would be impossible to devise any yardstick for measuring instructor requirements without studying the individual who will be doing the instructing. The following sub-divisions are devoted to such a study.

Source of Instructors

Service schools have three main sources for procuring their instructor personnel. The first and least important

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[1] J.H. Fox, C.E. Bish, and R.W. Ruffner, School Administration, p. 29.

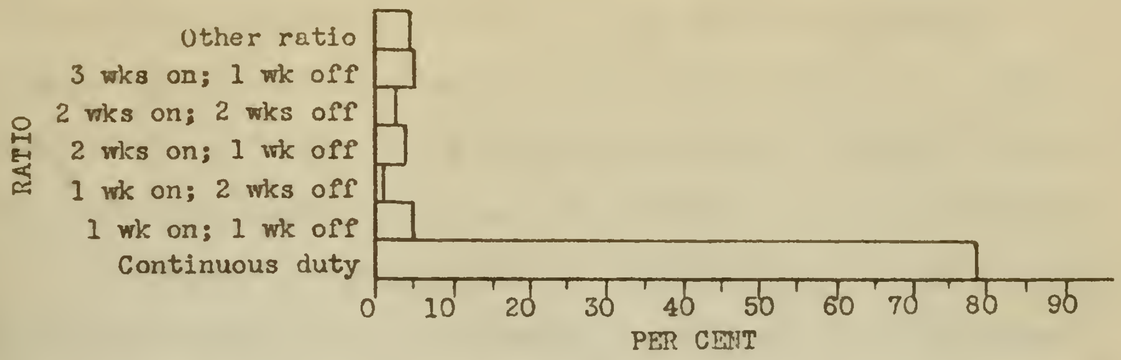

FIGURE 6. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING RATIO OF WEEKS WITH INSTRUCTOR DUTY TO NUMBER OF WEEKS WITHOUT SUCH DUTY

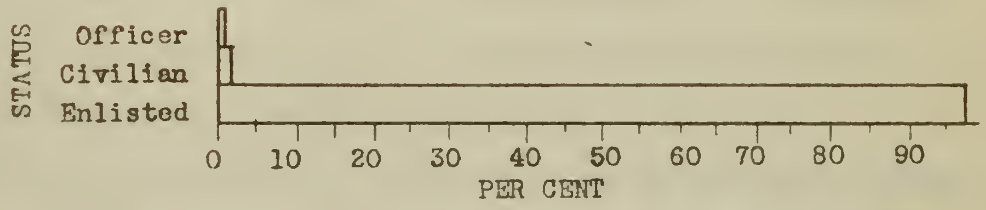

FIGURE 7. PROFESSIONAL STATUS OF INSTRUCTORS SURVEYED IN THIS STUDY

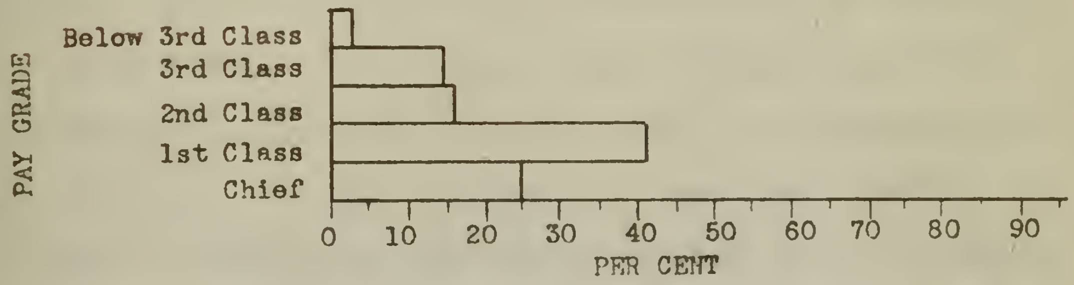

FIGURE 8. PETTY OFFICER STATUS (PAY GRADE) OF ENLISTED INSTRUCTORS SURVEYED IN THIS STUDY

or those in from civilian channels. Some instructional jobs require considerable background work in technical theory and it has often been found more economical to employ competent civilian teachers in a civil service capacity for this work. However, the numbers are very limited.

A second source is from the commissioned officer ranks. The actual numbers of commissioned officers is quite limited also. In general, officers teach only in schools having officer students.

The third and main source of procurement of instructors is from the enlisted ranks of the services. The majority of service school instructors are senior petty officers, although for some schools it is frequently necessary to employ junior men because of the scarcity of personnel with the necessary technical background.

The data illustrated in Figures 7 and 8 show the status of instructors in Memphis, Tennessee who were surveyed for this study.

Selection of Instructors

When it comes to the problem of the selection of instructors, the supply and demand qualification is the principal determinant. In general, every attempt is made to select personnel who volunteer for such duty, and who have had considerable service. However, if the demand exceeds the number of qualified volunteers on hand, it is frequently necessary to draft personnel for instructor duty. Fortunately, many men who know nothing of instructor duty often discover that it is enjoyable and satisfying after

they have been placed in an instructor status. Many others however, never like the duty and their contribution to an increased standard of instruction is questionable. As an indication of the situation existing in the Training Center at Memphis, Figures 9 and 10 show that less than 63 percent of the instructors asked for the duty, and yet over 85 percent either like the duty or would like it under different conditions.

A second difficulty arising from the problem of insufficient numbers to meet the demand is the policy of utilizing newly graduated students as instructors. This procedure has been described as "graduating a man one day, turning his hat around, and putting him in the school as an instructor the next day." The situation depends of course on the past experience of the man and the nature of the material he will be required to present. In some cases, the graduate of a Class B or C school would be the best qualified man for instructor duty in a Class A School. Unfortunately, men are usually sent to such schools for specific purposes, with orders to return immediately to the operating forces upon completion of the course of instruction. Their return to the school command in an instructor capacity at a later date is highly desirable. However, it is common practice among service schools to use graduates of basic Class A Schools as instructors in those same schools. This means frequently that a man will be assigned to instructor duty without any practical experience in the technical specialty which he is attempting to teach to the new student. Admiral Stump commented on this practice as follows:

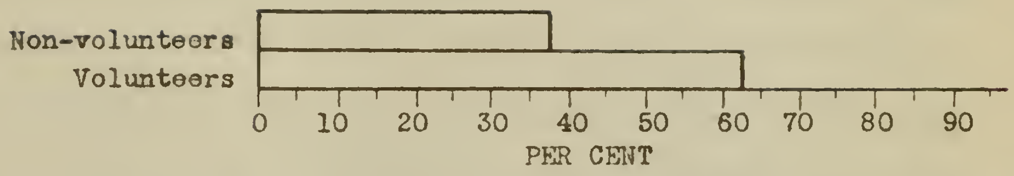

FIGURE 9. DISTRIBUTION OF VOLUNTEERS AND NON-VOLUNTEERS FOR INSTRUCTOR DUTY AMONG INSTRUCTORS SURVEYED FOR THIS STUDY

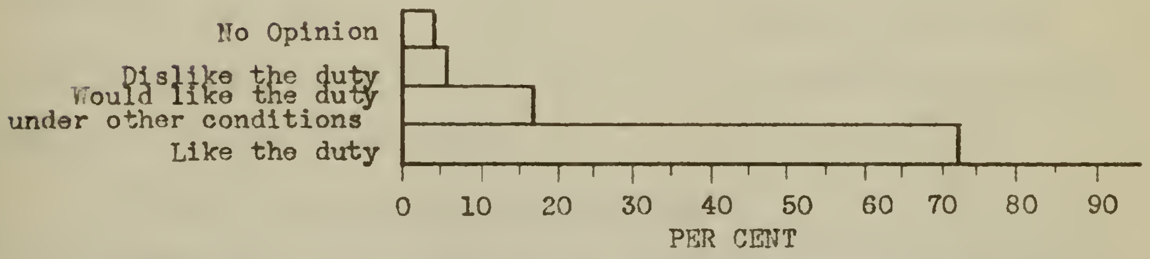

FIGURE 10. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING DESIRABILITY OF INSTRUCTOR DUTY

> The procedure of using such students as instructors is equivalent to taking pupils who have completed the eighth grade with slightly above average (not superior) grades for grammar school teachers. It wouldn't take long under such a system for our American educational system to completely deteriorate. The Navy will not get the kind of Electronics Technicians or Aircraft Mechanics that it positively must have by following such a system.[1]

The fact that service schools must operate with instructional personnel who have no desire for the duty and who in many cases are devoid of any practical experience in their technical specialty, must be considered when determining instructor requirements. Such features of the instructor problem limit the amount of information which such instructors can present to the students, and thereby increases the number of instructors required. As with any business enterprise, great economies could be obtained if all personnel employed were completely motivated and qualified for the job. However, if such personnel are not available, production costs will rise, particularly in the manpower requirement field.

Personal History of Instructors

Information relative to the personal history of the instructors at the Training Center in Memphis is given in Figures 11, 12, 13, and 14. As indicated, the group as a whole is quite mature and experienced in federal service. This is probably a natural expectation. It is interesting to note, however, that there is considerable difference

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1. Felix B. Stump, Admiral, U.S.N., Former Chief of Naval Air Technical Training, in an official letter to the Chief of Naval Personnel Dated Memphis, Tennessee, 6 August 1948.

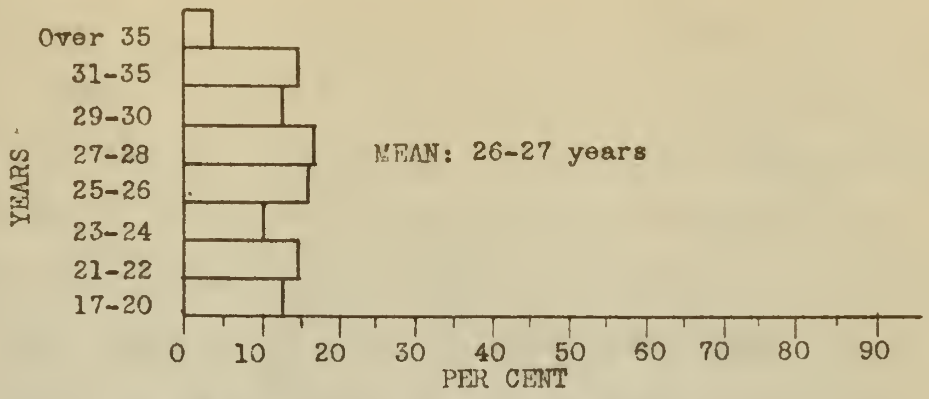

FIGURE 11. AGE DISTRIBUTION OF INSTRUCTORS SURVEYED FOR THIS STUDY

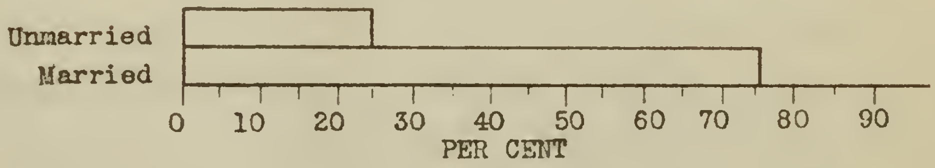

FIGURE 12. MARITAL STATUS OF INSTRUCTORS SURVEYED FOR THIS STUDY

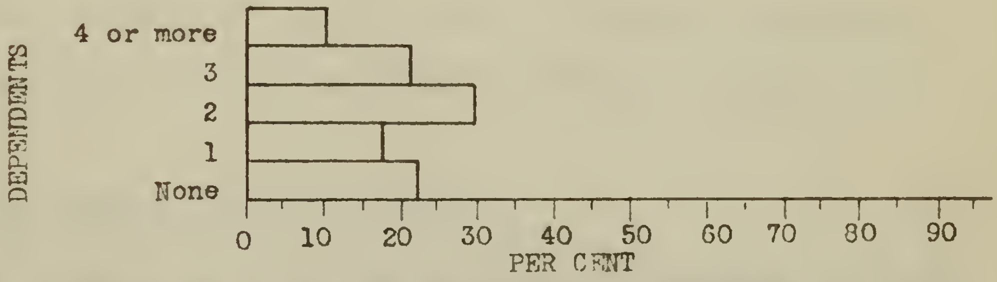

FIGURE 13. DEPENDENCY STATUS OF INSTRUCTORS SURVEYED FOR THIS STUDY

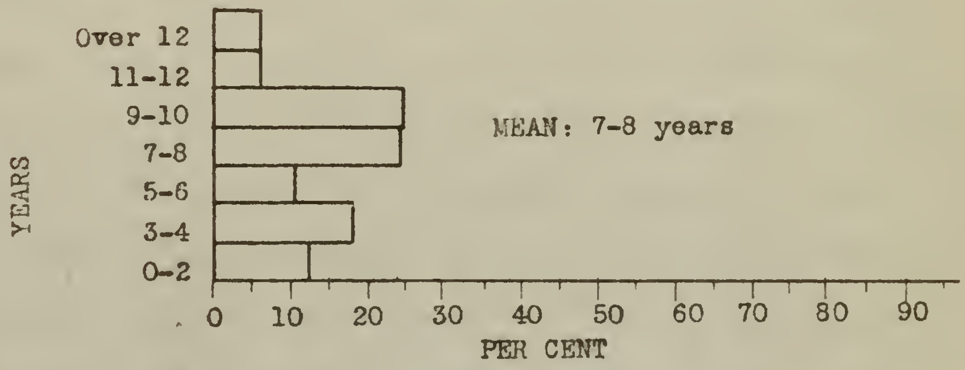

FIGURE 14. YEARS OF FEDERAL SERVICE BY INSTRUCTORS SURVEYED FOR THIS STUDY

between instructors in different types of schools. For example, in Figures 15 and 16 it is shown that the personnel in the electronics schools are considerably younger and have less federal service than the machinist instructors. As a result, they probably have less motivation for instructor duty. This may be caused by the fact that more electronics instructors are needed than machinists, and hence more graduates of the Class A Electronics School are retained for instructor duty after graduation.

Such factors should be considered by top management when computing instructor requirements. If the nature of the school is such that instructor personnel will be immature, and less qualified, more instructors will be required. On the other hand, if the school is one for which plenty of experienced, mature instructors are available, less personnel will be required to handle the same work load.

Qualifications of Instructors

The qualifications of instructors for service schools vary greatly. There are variations between services, between schools in the same service, and between individuals in the same school. The general policy is to obtain personnel with considerable background in the operating forces. Very few personnel ordered to instructor duty have ever done any teaching in formalized schools. An indication of the situation at the Training Center in Memphis is illustrated in Figure 17 which shows that there is little difference between total teaching experience and experience on

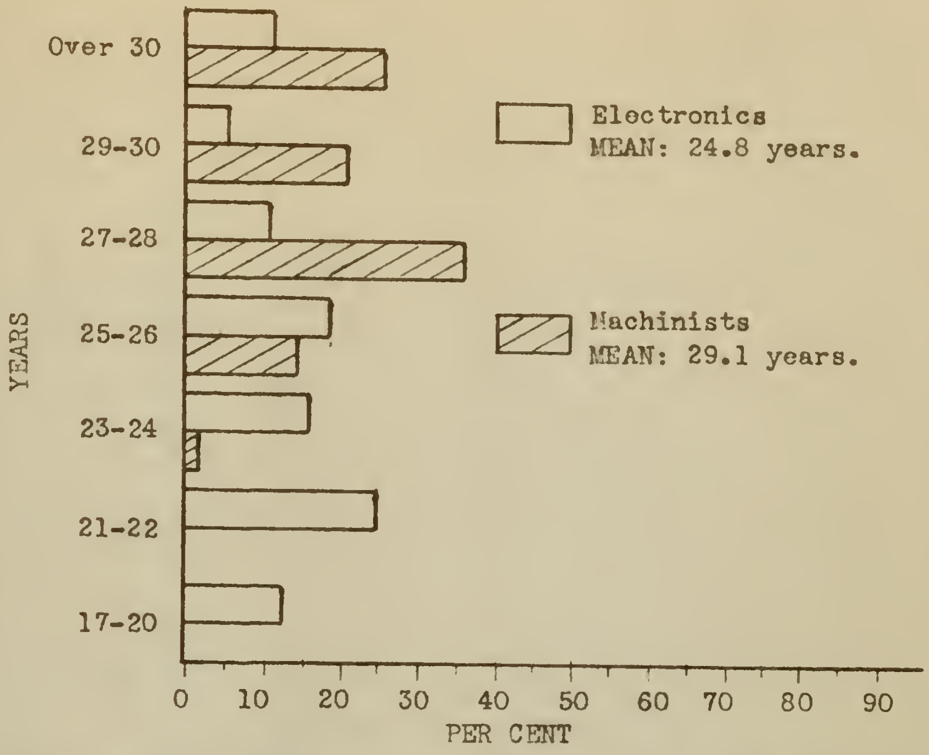

FIGURE 15. AGE DISTRIBUTION OF ELECTRONICS AND MACHINIST INSTRUCTORS

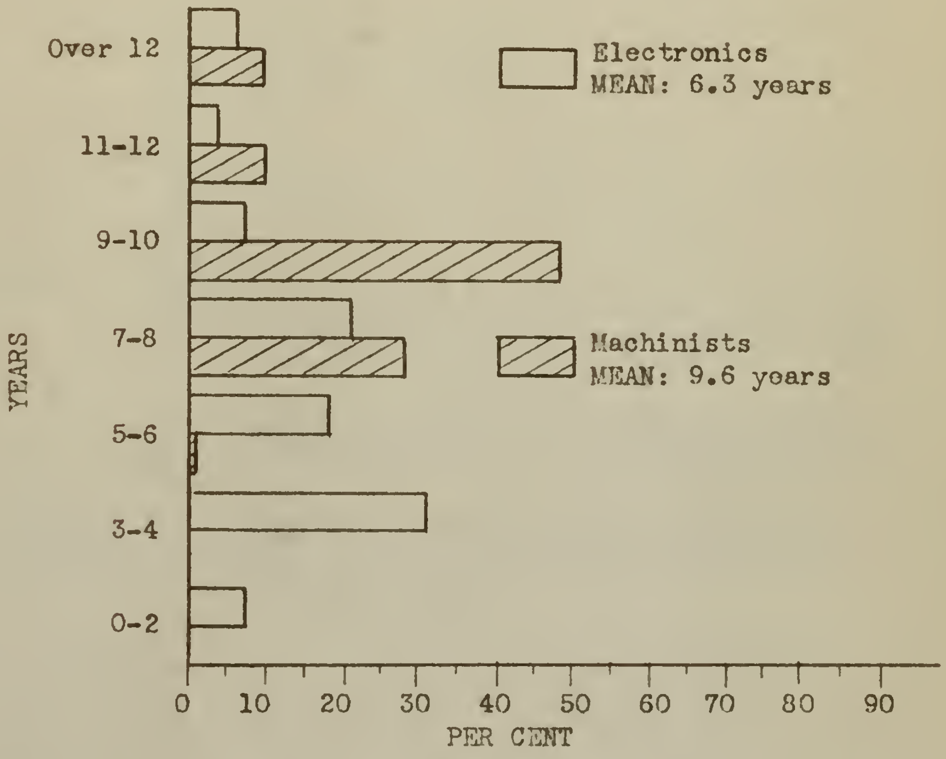

FIGURE 16. COMPARISON OF FEDERAL SERVICE BY ELECTRONICS AND MACHINIST INSTRUCTORS

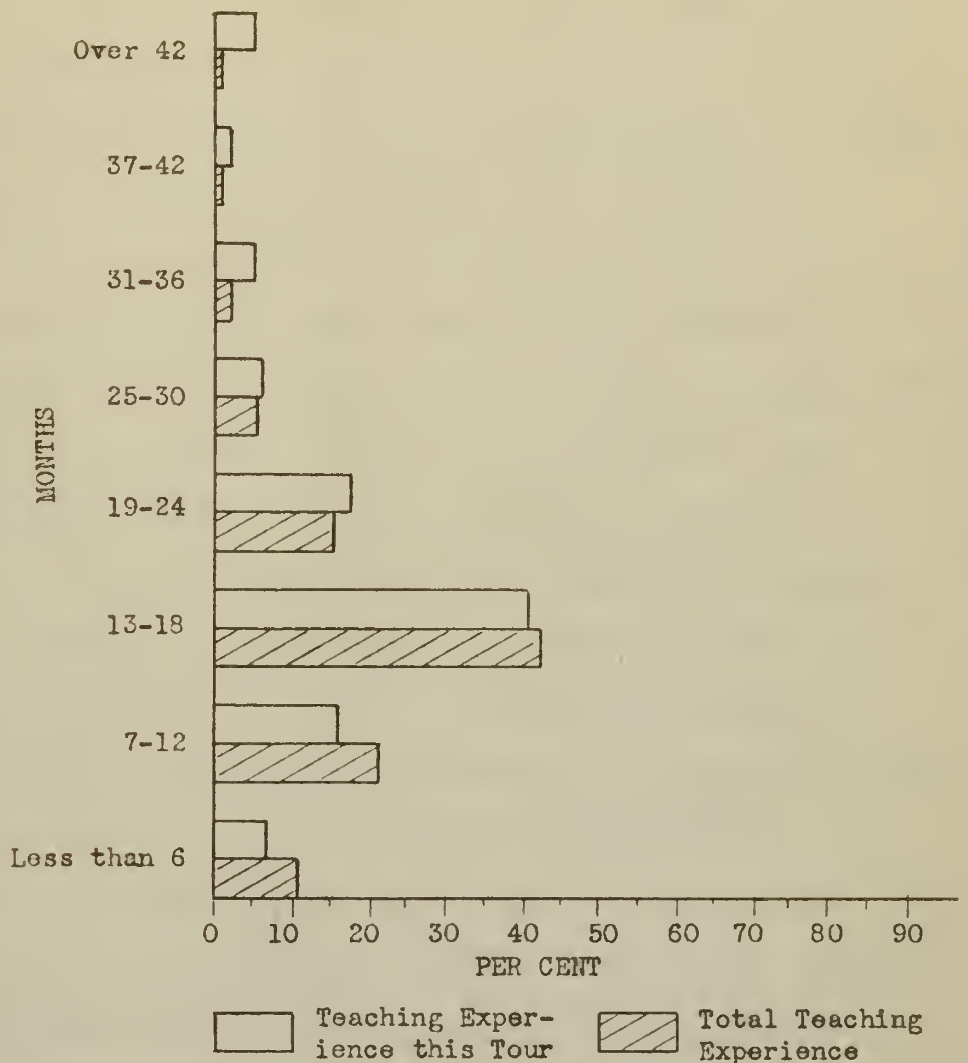

FIGURE 17. COMPARISON OF TOTAL TEACHING EXPERIENCE AND TEACHING EXPERIENCE ON PRESENT JOB FOR INSTRUCTORS SURVEYED IN THIS STUDY

the present job. Differences that do exist would probably be created by the few civilian instructors who are professional teachers. In Figure 15 the overall experience picture is shown for the instructors and supervisors surveyed in Memphis. This Figure indicates that the major qualifications attained prior to reporting for instructor duty are a high school diploma, completion of a Class A School, completion of a Class B or C School, and completion of over two years service with the operating forces. This Figure also demonstrates that service school administrators consider these same four qualifications as minimum requirements for instructor duty in their schools. This fact is further substantiated by the data in Figure 16 since it shows that these same service qualifications (exclusive of formalized instructor or supervisor training) have contributed most to success in instructor duty. It appears that the assignment of personnel to instructor duty who have not attained these minimum qualifications would be unfair to the individuals so assigned and would not contribute much to the standard of instruction. Here again, top management should keep such qualifications in mind when determining the load for any school. If the proper number of personnel with these qualifications cannot be obtained, it might be more economical to reduce the size of the student body, even if it means doing without the number of technicians needed. It would seem better to have a small group of fully qualified technical experts than a large mass of half trained personnel, particularly when

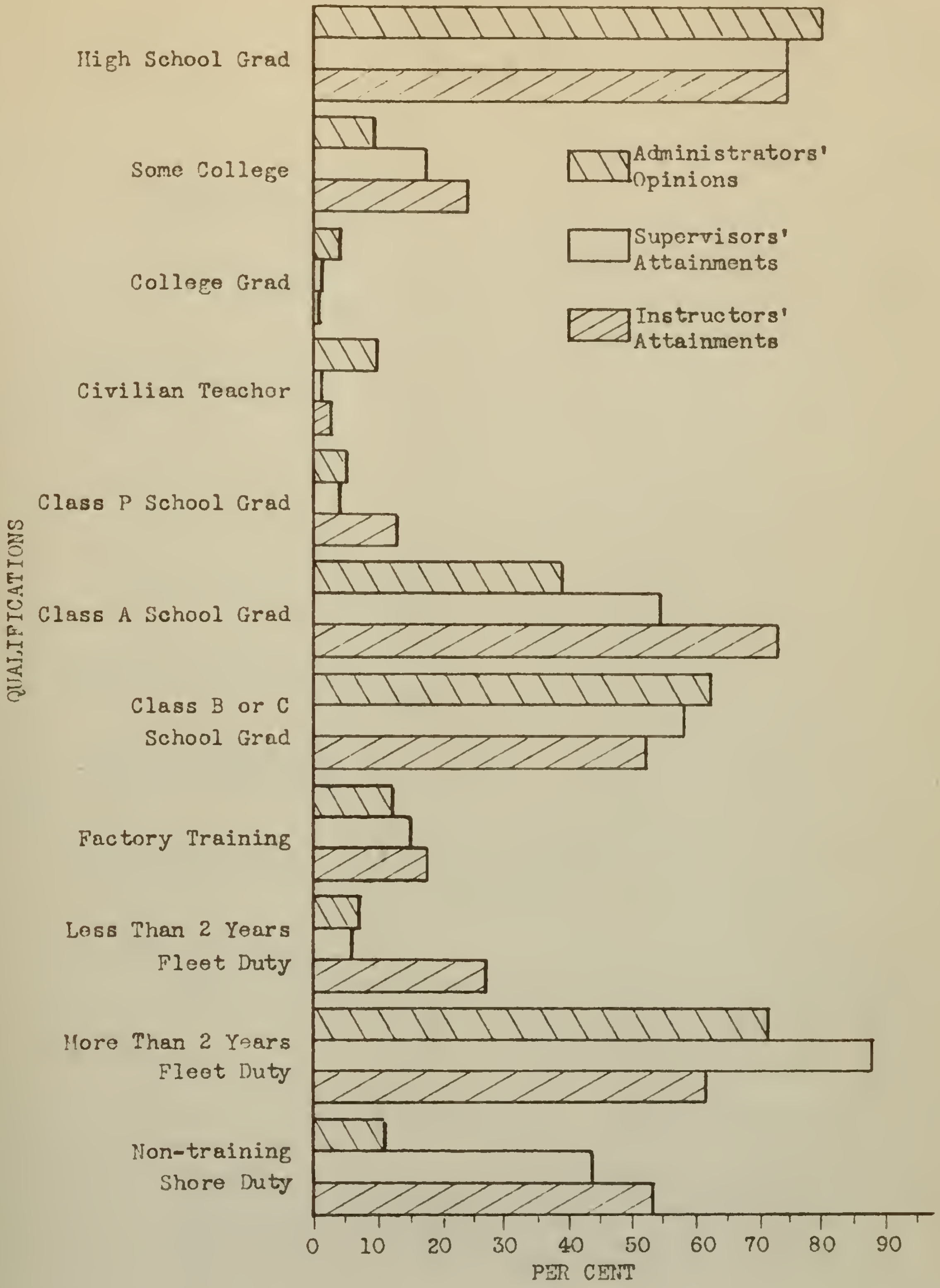

FIGURE 18. QUALIFICATIONS ATTAINED BY INSTRUCTORS AND SUPERVISORS COMPARED WITH ADMINISTRATORS' OPINIONS OF MINIMUM QUALIFICATIONS CONSIDERED NECESSARY FOR INSTRUCTOR DUTY

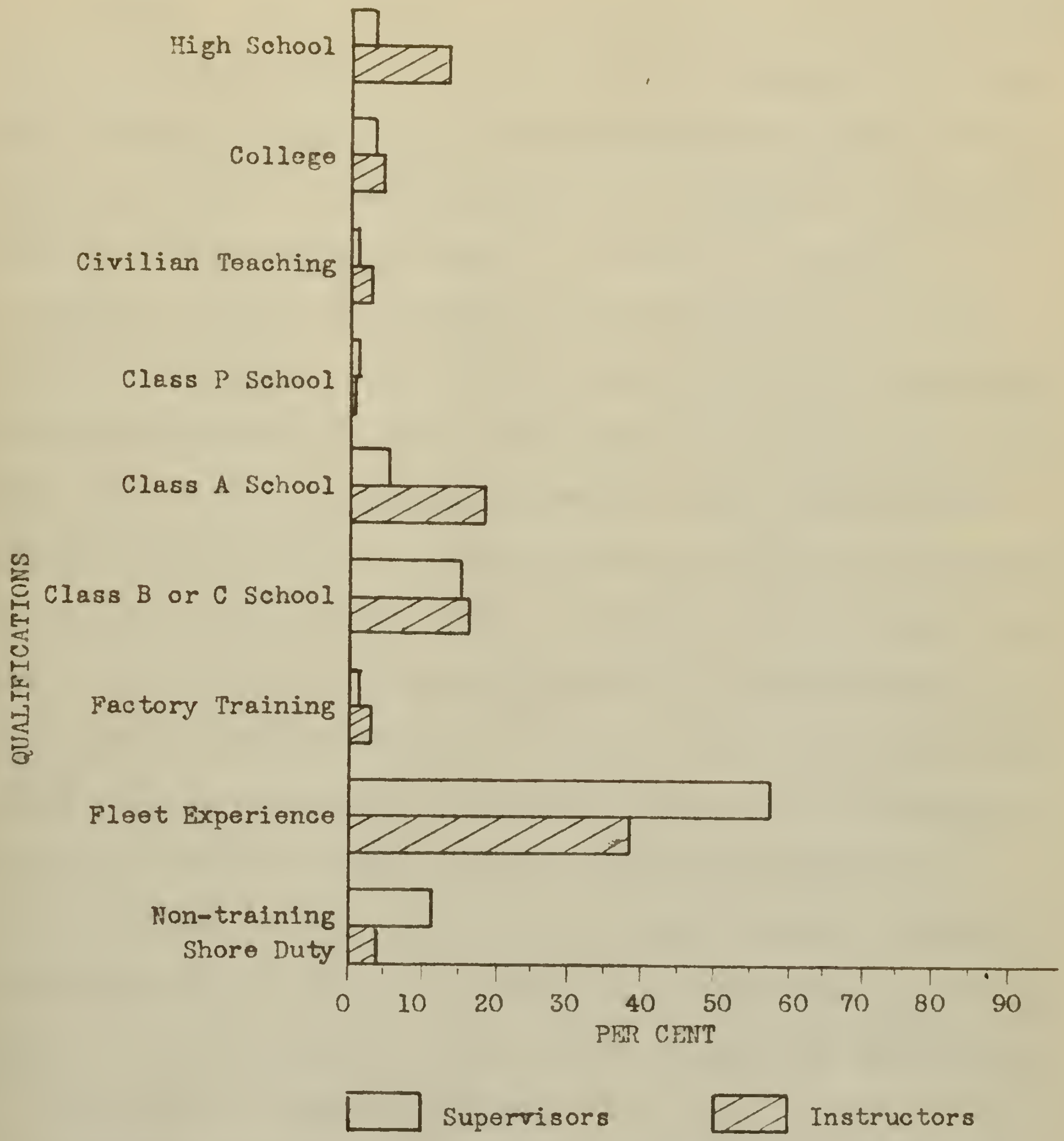

FIGURE 19. INSTRUCTORS' AND SUPERVISORS' RESPONSE TO QUESTION CONCERNING THE SINGLE QUALIFICATION THAT CONTRIBUTED MOST TO SUCCESS AS AN INSTRUCTOR AND/OR SUPERVISOR (EXCLUDING FORMALIZED INSTRUCTOR AND/OR SUPERVISOR TRAINING)

the expense of providing this ineffective training is considered.

Training of Instructors

Despite the fact that the primary function of the armed services during peace time is to train personnel, few members of the services have had experience in formalized schools, either as administrators or teachers. Many, of course, are required to perform several of the duties of a teacher through the training that is carried on in the operating forces. Also, if it is true that one of the fundamental requirements of a good teacher is leadership ability, many service personnel learn the essentials of this teacher qualification in their every day service activities. It would seem then that after a certain length of service and with the acquiring of certain technical knowledge, the majority of service personnel eligible for instructor duty would require little if any indoctrination in the methods of the formalized school, particularly when they are to use the service school technique of instruction. However, experience has shown that considerable training must be given to the individual before he is considered qualified to take over a class on his own.

The Navy has seen fit to establish three formalized instructor training schools for the express purpose of giving instruction in teaching techniques and principles of supervision. These schools are located in Norfolk, Virginia, San Diego, California, and Memphis, Tennessee, the latter being limited to instructor candidates for naval

air technical training schools. At the Memphis school, four weeks are devoted to teaching techniques. A two weeks course in principles of supervision is given to prospective supervisors. In Figure 20, it is shown that a large majority of the personnel at the Training Center in Memphis, have received instruction in this school. There were only sixteen instructors and one supervisor who had not attended at least one of the courses.

The worth of this training is illustrated in Figure 21 which shows that 42 percent of the instructors and 63 percent of the supervisors considered that the training received in this school contributed more to their success as instructors and/or supervisors than any of their past experience or qualifications. The necessity for such training is indicated in Figure 22 where it is shown that the majority of instructors, supervisors, and administrators consider training received in this school, a necessary qualification before the average candidate can qualify for an assignment as an instructor. In Figure 23 similar opinions are shown relative to the necessity for such training for supervisors.

Formalized teacher training will not by itself prepare the average service school instructor candidate for teaching duty. It has been found necessary to increase his technical competence before he can be placed in front of a group of students. Indoctrination into the ways of the particular school to which he is assigned is necessary and absolute comprehension of the material for which he is

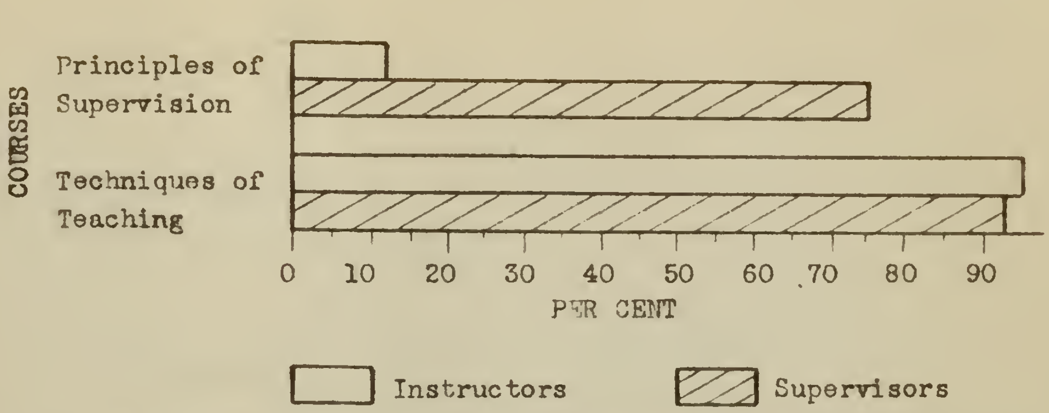

FIGURE 20. NUMBER OF INSTRUCTORS AND SUPERVISORS AMONG THOSE SURVEYED WHO HAVE COMPLETED FORMALIZED COURSES IN TEACHER TRAINING

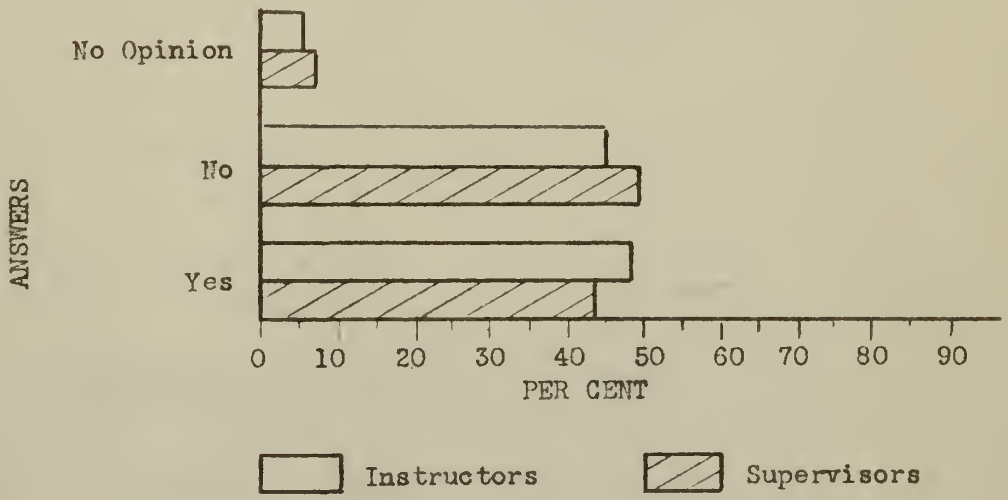

FIGURE 21. RESPONSE OF INSTRUCTORS AND SUPERVISORS TO QUESTION ASKING IF THEY CONSIDERED THAT THEIR FORMALIZED TEACHER TRAINING HAD CONTRIBUTED MORE TO THEIR SUCCESS AS INSTRUCTORS AND/OR SUPERVISORS THAN ANY OTHER PREVIOUS EXPERIENCE

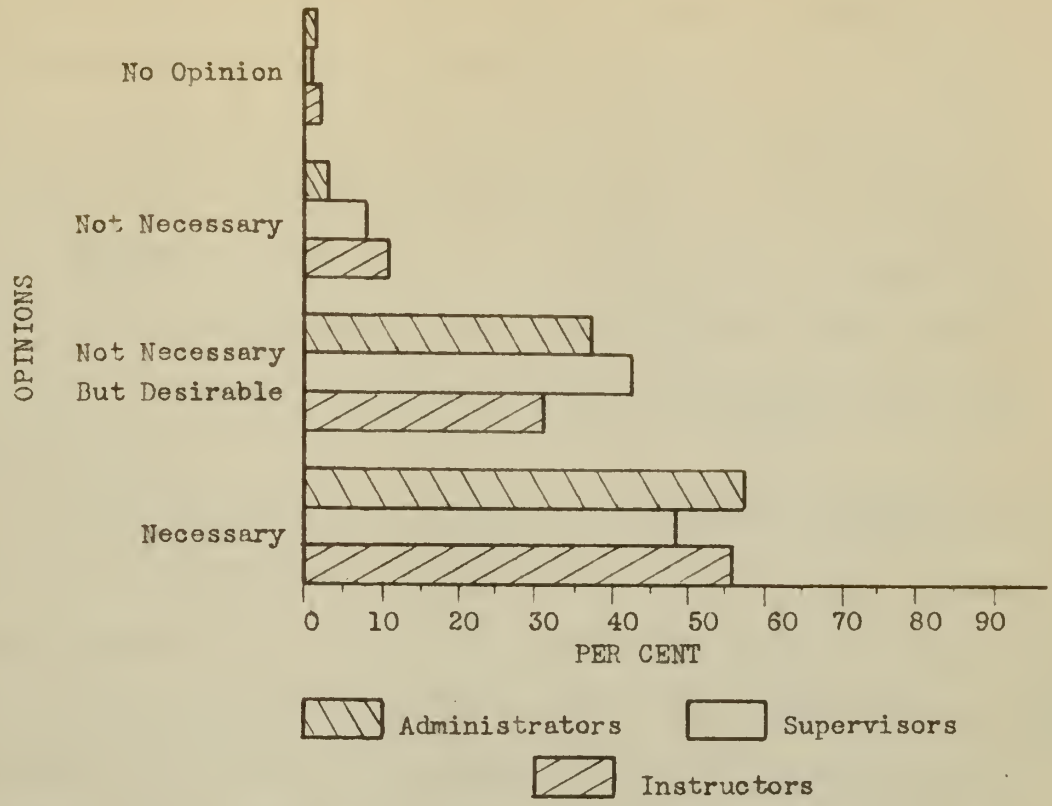

FIGURE 22. OPINIONS OF INSTRUCTORS, SUPERVISORS, AND ADMINISTRATORS RELATIVE TO NECESSITY OF FORMALIZED INSTRUCTOR TRAINING BEFORE THE AVERAGE CANDIDATE CAN QUALIFY FOR AN ASSIGNMENT AS AN INSTRUCTOR

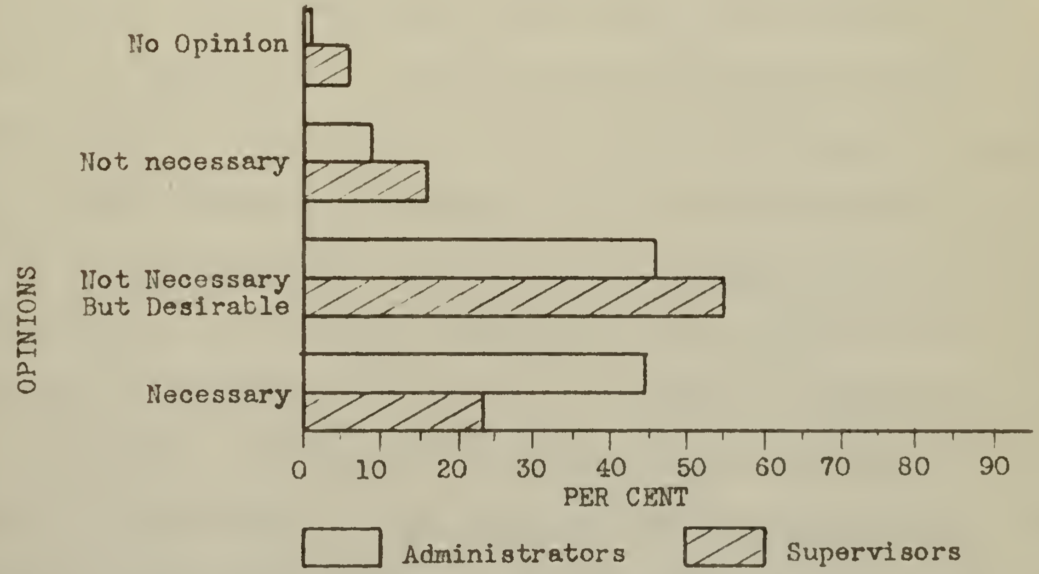

FIGURE 23. OPINIONS OF SUPERVISORS AND ADMINISTRATORS RELATIVE TO NECESSITY OF FORMALIZED SUPERVISOR TRAINING BEFORE THE AVERAGE CANDIDATE CAN QUALIFY FOR AN ASSIGNMENT AS A SUPERVISOR

responsible is desired. To accomplish these conditions, additional time is required in the training of the candidate. A discussion of the amount of time which should be devoted to this indoctrination and phase or unit instruction is included in Chapter V. An indication of the amount of time which is now devoted to such initial indoctrination of instructors at the Training Center in Memphis is given in Figure 24.

In addition, there is need for continuous technical instruction of instructors during their tour of duty. Because of the nature of the system of instruction which is used, extreme boredom and fatigue often ensue. To guard against this, and also to make for better standards of instruction, it is intended in most service schools that instructors shall be rotated from unit to unit and phase to phase. Over 50 percent of the Memphis instructors are rotated in this manner as shown in Figure 25. This means that they should be learning the material in another unit or phase while they are teaching the subject matter in the phase or unit for which they are responsible. Upon achieving competence in the new phase or unit, the instructor is given that material as his responsibility, either in addition to his old unit material, or in place of it. The theory of this plan is that it will eliminate boredom and cut down on fatigue. Whether or not the theory is correct is still a matter of question. It is interesting to note, however, that of the 253 instructors who are not rotated, 65 (26 percent) are bored with their work. Of the 357 instructors that are rotated, only 59 (17 percent) are bored. This information is shown in

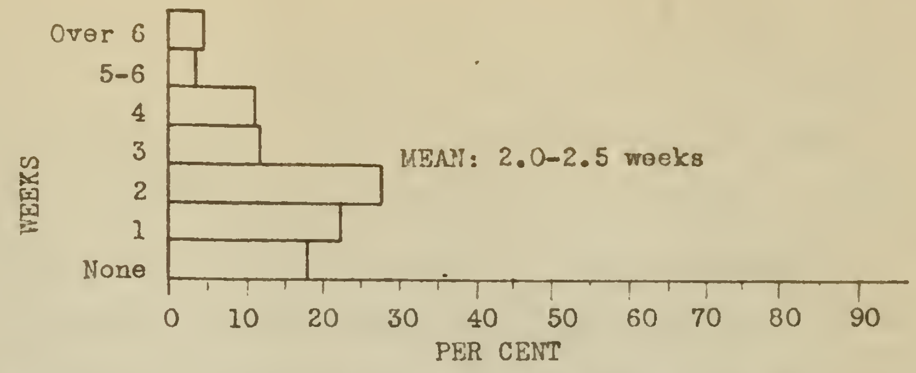

FIGURE 24. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING AMOUNT OF TIME DEVOTED TO THEIR INDOCTRINATION AND PHASE OR UNIT INSTRUCTION PRIOR TO BEING CONSIDERED FULLY QUALIFIED FOR INSTRUCTOR DUTY (EXCLUDING FORMALIZED TEACHER TRAINING)

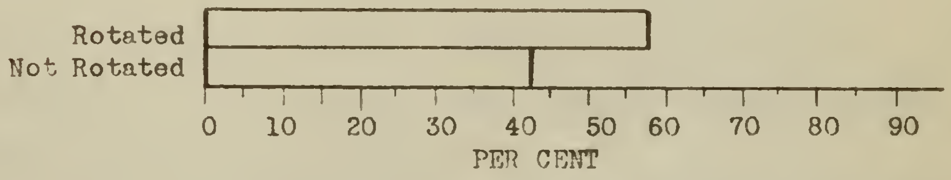

FIGURE 25. NUMBER OF INSTRUCTORS ROTATED FROM PHASE TO PHASE AND UNIT TO UNIT AS THEY BECOME QUALIFIED TO PRESENT THE MATERIAL IN THE NEW PHASE OR UNIT

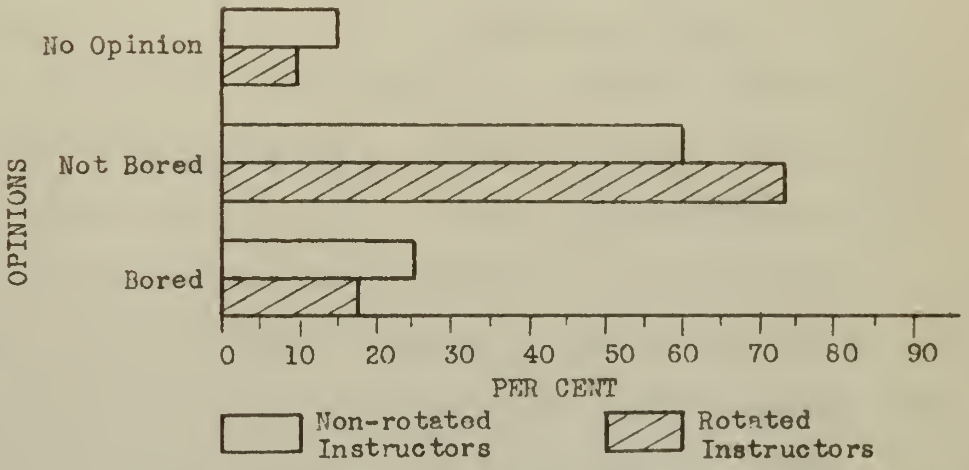

FIGURE 26. EFFECT ON BOREDOM OF ROTATION OF INSTRUCTORS FROM PHASE TO PHASE AND UNIT TO UNIT OF THE COURSE OF INSTRUCTION

Figure 26. One of the greatest advantages of this plan lies in the fact that the best qualified technician in the field should be an ex-instructor, and he should be able to pass on much of the information he has learned to members of the operating forces, when he is assigned to these commands.

It is interesting to note that although the theory of the system calls for continuous phase instruction of the instructors, over 65 percent of the Memphis personnel stated that they were not receiving such instruction, as indicated in Figure 27. This may account for the fact that 30 percent of the total group said that they were bored and only 50 percent of the instructors state that they are rotated. It would seem that further investigation of this matter might be warranted.

There is still another phase of technical instruction for instructors which must be considered in their training program, and that is specialized training in factories or manufacturing plants. If a new piece of equipment is put into production and sent to the operating forces, it is necessary that technicians graduating from the schools be familiar with this equipment. The best place, and practically the only place to gain initial acquaintance with the new gear is in the factory where it is manufactured. Many ideas for training aids are conceived at this time and much of the preliminary planning for incorporation of the necessary training material is accomplished. Some idea of the number of personnel at the training center in

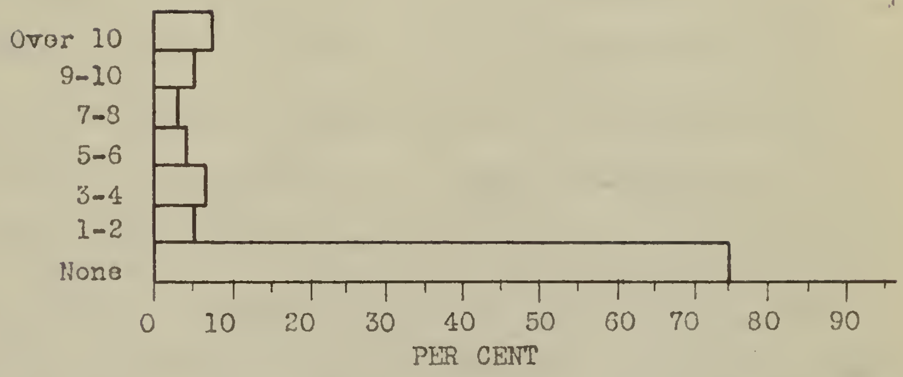

FIGURE 27. TIME DEVOTED BY INSTRUCTORS EACH WEEK TO THE ATTENDANCE OF PHASE OR UNIT INSTRUCTION IN ADDITION TO REGULAR TEACHING DUTIES IN ORDER TO QUALIFY FOR TEACHING DUTY IN A NEW PHASE OR UNIT

people who have received factory training is given in Figure 11 (p. 54) and the comparative worth is illustrated in Figure 12 (p. 56).

If the need is recognized for formalized instructor training, continuous phase or unit instruction, and occasional factory training, provision for this training must be made when computing instructor requirements for any service school.

Utilization of the Instructor

After the instructor has been trained adequately to assume full responsibility for presenting material to his students, the next element of the instructor requirement problem which must be considered is the utilization of the instructor. What are the duties which he must perform and how long a work week can he be expected to maintain? How many hours a day can an instructor be expected to spend in front of his students and still do a good job? What is the maximum number of hours in a week that an instructor can efficiently perform in a teaching capacity? A specific and detailed discussion of this point is covered in Chapter V where certain standards for a service school instructional work week are derived.

In any learning institution, proper presentation of the material cannot be accomplished by the instructor without adequate preparation. Service school teaching methods probably require at least as much if not more preparation time for the instructor than normal teaching procedures. The vast amount of visual aid material which is used, the

demonstrations which must be set up, and the constant changes taking place in the subject material, all put strenuous requirements on the service school instructor when it comes to preparing for his class. The data given in Figure 28 shows that a mean of 5.5-6.0 hours a week is devoted to preparation for classes by the instructors at the Training Center in Memphis and Figure 29 indicates that 19.5 percent of the instructors did not consider that they had sufficient time available for preparation.

Closely related to the problem of class preparation is the subject of instructional aids. Despite the fact that many aids are provided by the services for their instructors, and even though some training commands have special shops established for the manufacture of training aids, most service school instructors are encouraged to manufacture as many of their own aids as possible. This practice naturally increases the instructor's interest in his work and should make for better instructional standards. However, it is an element that requires time on the part of the instructor and must therefore be considered in his work week. Furthermore, repair and maintenance of instructional aids is a factor in the instructor utilization problem. Some schools have separate maintenance forces to keep instructional equipment repaired. However, many instructors are required to repair their own equipment and this is time consuming. An indication of the amount of time devoted to this phase of instructor utilization is shown in Figure 30 which shows that the approximate mean for each instructor is 4.5 hours per week.

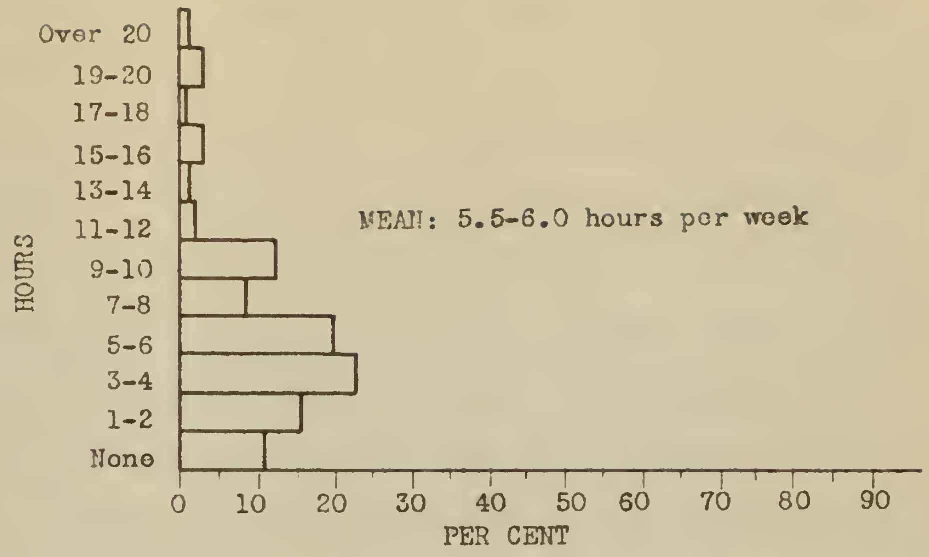

FIGURE 28. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF HOURS A WEEK DEVOTED TO PREPARATION FOR CLASSES

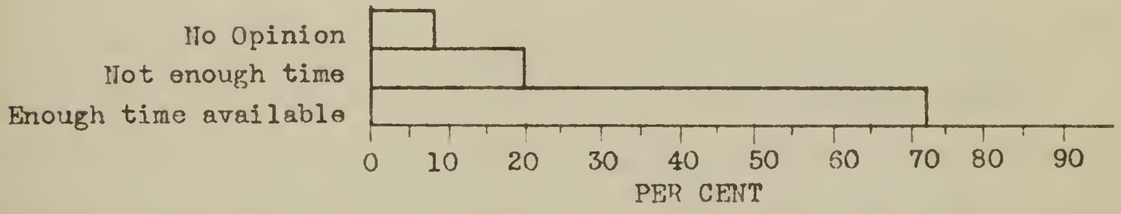

FIGURE 29. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING AMOUNT OF TIME AVAILABLE FOR PREPARATION FOR CLASSES

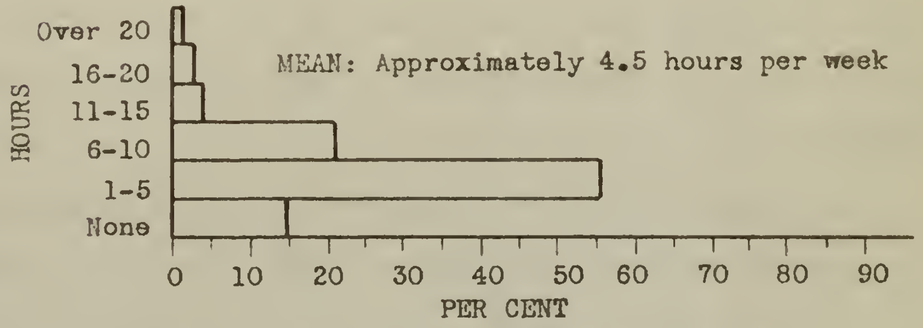

FIGURE 30. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF HOURS A WEEK DEVOTED TO REPAIRING INSTRUCTIONAL EQUIPMENT AND CONSTRUCTING INSTRUCTIONAL AIDS

Extra instruction for certain students is a problem in many schools. In some cases it is given in the form of night classes for all personnel not maintaining certain academic standards. In others, it is given on a voluntary or tutor basis. Whether or not such instruction accomplishes any good in service schools is probably largely dependent on the manner in which such instruction is administered. In any case, it requires additional time on the part of the instructor. If the material presented by any school is of such nature that it is too difficult for many of the students to assimilate, extra instruction will be necessary, and allowance for this fact must be made when considering the number of instructors required for that school. In Figures 31 and 32 an indication is given of the amount of time which the instructors in Memphis devote to the problem of extra instruction. In Figure 33 it is shown that only about one third of the Memphis instructors considered that their night classes were beneficial, while a considerably higher percentage of administrators and supervisors considered such instruction helpful. However, a comparison of Figures 32 and 33 will show that several instructors not concerned with night classes elected to comment on the worth of such classes. The significance of the opinions on this subject is doubtful.

It has been mentioned previously that the curriculum and hence the course of study of service schools are undergoing constant change and revision. This is the natural expectation for any school preparing technicians to operate and maintain equipment that is continually undergoing

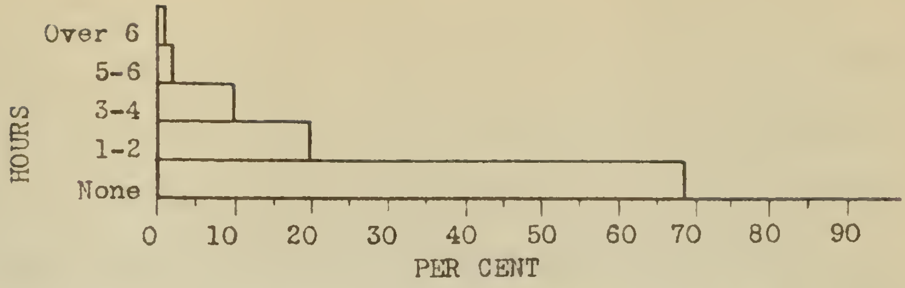

FIGURE 31. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF HOURS A WEEK OUTSIDE OF NORMAL WORKING HOURS DEVOTED TO EXTRA INSTRUCTION (DOES NOT INCLUDE NIGHT CLASSES)

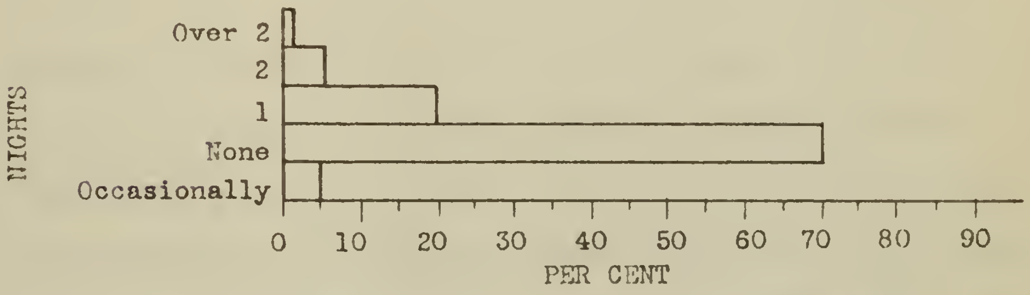

FIGURE 32. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF NIGHTS A WEEK DEVOTED TO NIGHT CLASSES

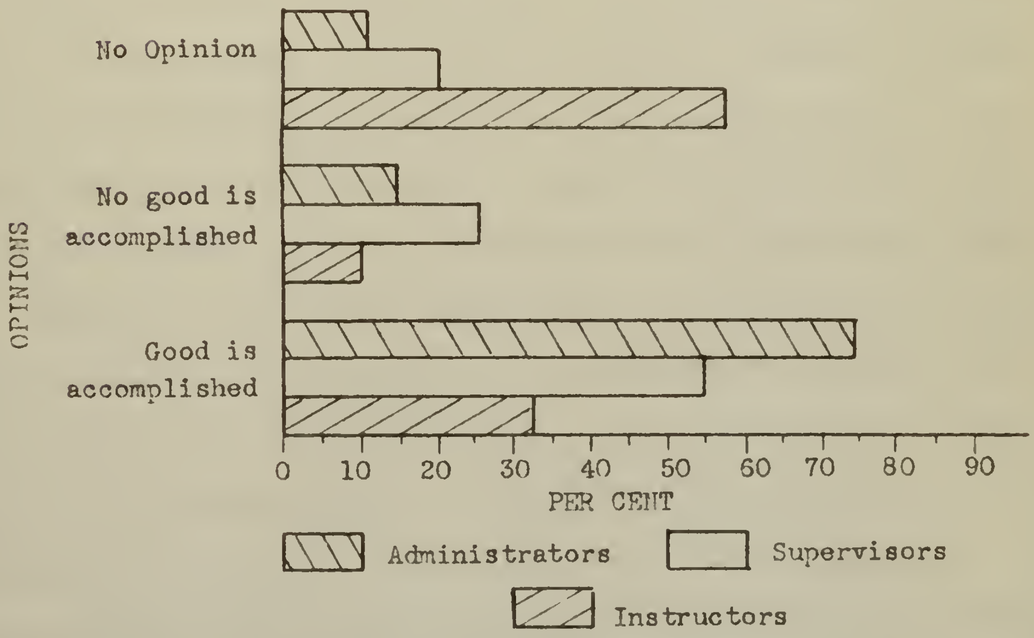

FIGURE 33. OPINIONS OF INSTRUCTORS, SUPERVISORS, AND ADMINISTRATORS RELATIVE TO THE AMOUNT OF GOOD ACCOMPLISHED BY NIGHT CLASSES

improvement, modification, and replacement. Keeping the courses of study up-to-date and correlated with the equipment which the operating forces are using, requires considerable time and effort. There is some difference of opinion among training personnel as to who should be charged with the actual preparation and revision of the curriculum and courses of study. It seems logical that personnel in the schools would be the best qualified to perform this work. Figure 34 illustrates the opinions on this subject by several administrators in the Memphis schools, and Figure 35 gives an indication of the amount of time devoted to such work by the instructors and supervisors during the past six months. This work load must be considered when evaluating instructor utilization in a service school to determine the number of instructors required.

Another element of instructor utilization which merits comment is the subject of homework review. Several schools consider the homework assignment an excellent means of improving the instruction problem. Naturally, the review of such work requires time for which there must be some provision. Over one half of the instructors at Memphis are required to review homework assignments, as indicated in Figure 36.

The last item to be discussed under utilization is the subject of military duties. Although the majority of the administrative duties of the school are performed by a separate administrative and maintenance force, service school instructors and supervisors frequently are required to perform certain duties which are strictly military in nature.

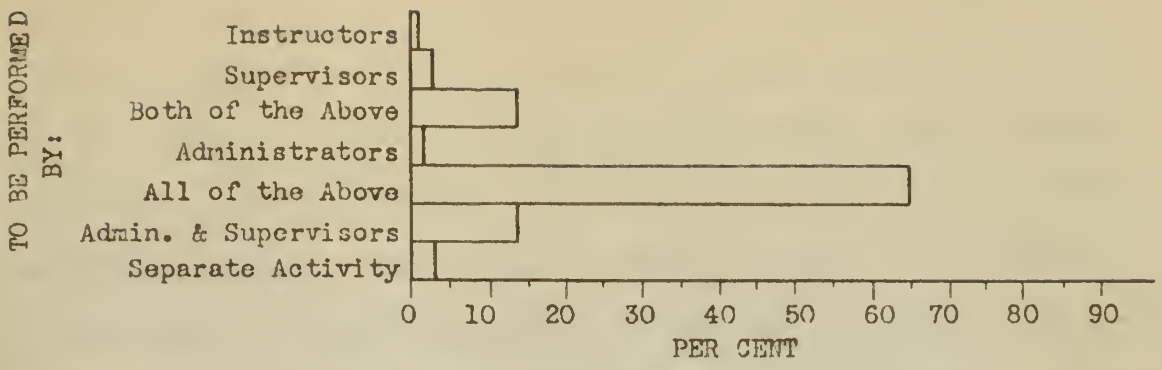

FIGURE 34. ADMINISTRATORS' RESPONSE TO QUESTION ASKING WHICH PERSONNEL SHOULD BE REQUIRED TO PERFORM THE WORK INVOLVED IN THE PREPARATION AND REVISION OF THE CURRICULUM AND COURSE OF STUDY

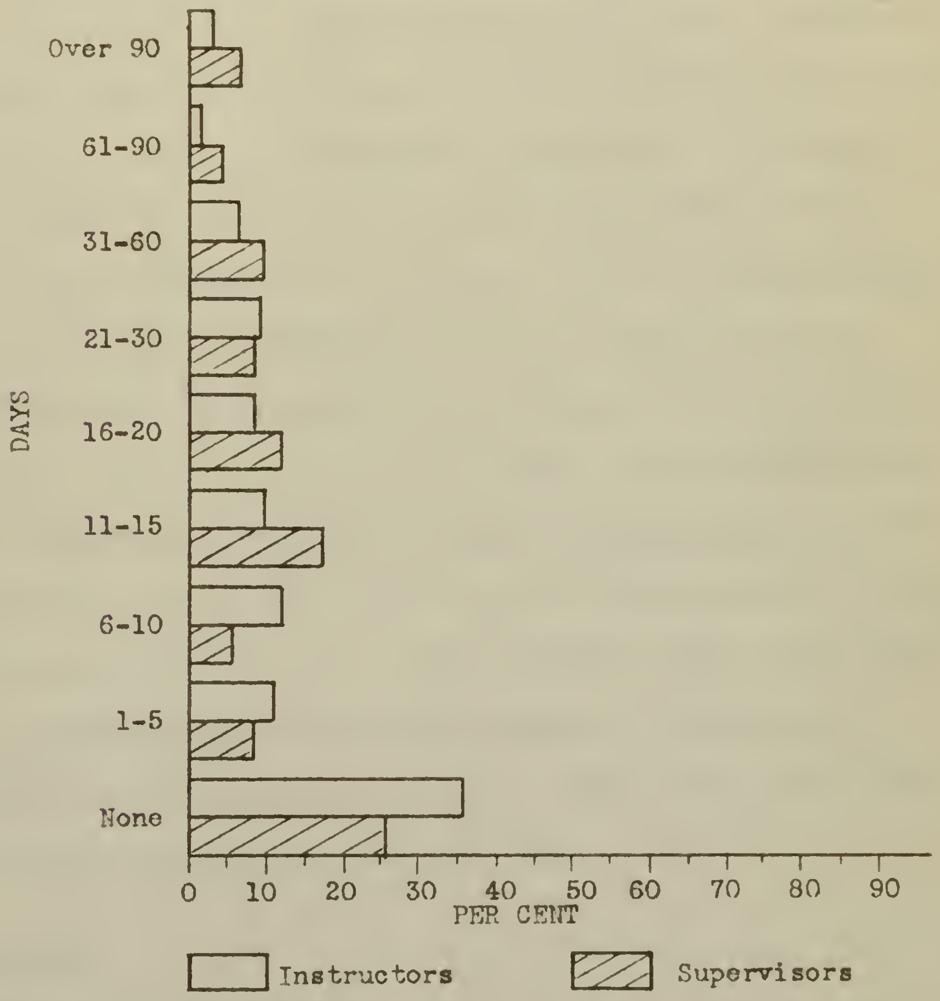

FIGURE 35. INSTRUCTORS' AND SUPERVISORS' RESPONSE TO QUESTION CONCERNING NUMBER OF DAYS DURING PAST SIX MONTHS DEVOTED TO PREPARATION OR REVISION OF THE CURRICULUM OR COURSE OF STUDY

They generally are assigned to a watch section which must remain aboard the station in a duty status on certain days of the week. Duty day to liberty day ratios vary for individuals within individual schools, as do the nature of the military duties. Some schools make a policy of requiring instructors to conduct night instruction or extra instruction classes on days when they are in a duty status. The question as to whether or not instructors and supervisors should be required to perform any military duties while in an instructor status has been debated many times. Various programs have been devised to accommodate varying situations. Figures 37 and 38 give an indication of the duty-liberty ratios and hours devoted to military duties respectively for the Memphis instructors. However, it is not considered that data presented in these Figures is of much worth in view of the various interpretations which could be given to the questions used in procuring the data. Some instructors considered the entire duty day as military in nature while others considered just the time devoted to standing a sentry watch. The significance of military duties when computing instructor requirements is not very great unless it is expected that an excess of such duties will be imposed, in which case ample allowance must be made.

The Supervisor

Need for the Supervisor

Although considerable discussion of the position of the supervisor has been included previously in the discussion of the instructor, it is considered that the importance of

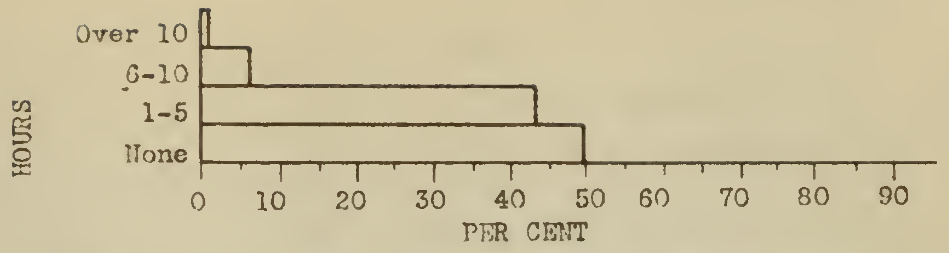

FIGURE 36. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF HOURS A WEEK DEVOTED TO THE REVIEW OF STUDENTS' HOMEWORK

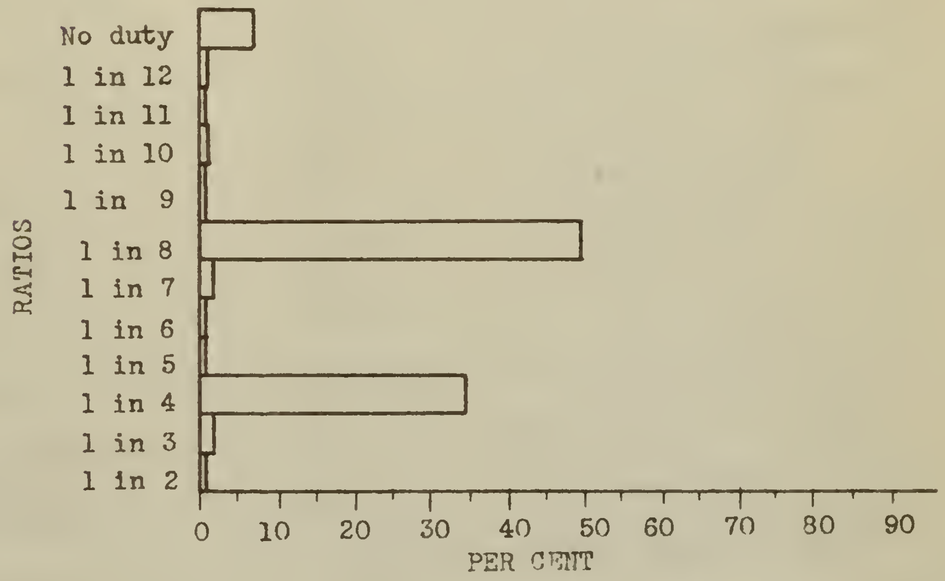

FIGURE 37. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING RATIO OF DUTY DAYS TO LIBERTY DAYS

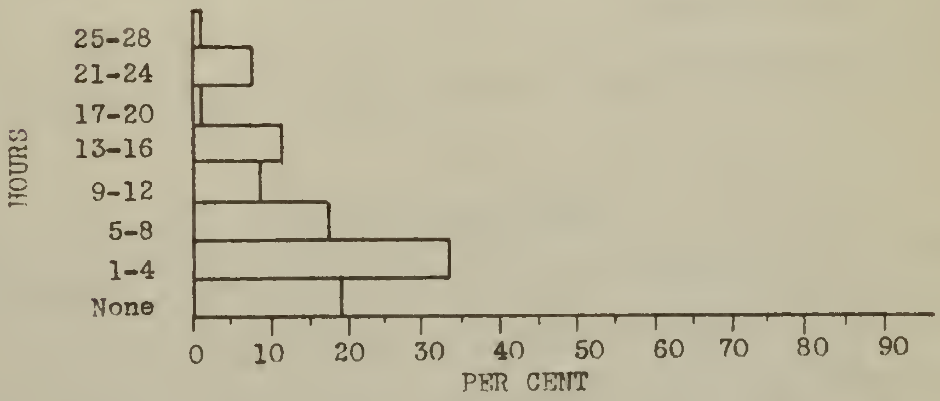

FIGURE 38. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF HOURS A WEEK DEVOTED TO DUTIES STRICTLY MILITARY IN NATURE, SUCH AS SENTRY WATCHES, FIRE WATCHES, ETC.

the supervisor in the instructor requirement problem bears special attention. Although all schools have supervisory personnel of some sort or another, it seems logical that service schools would definitely require such personnel in view of the industrial nature of the instructional techniques employed. The first line supervisor is of key importance in industry, and he occupies a similar position in the service school. An example of the need and worth of such personnel is shown in Figure 39 where it is indicated that over 95 percent of the administrators in the Memphis schools considered the supervisor a necessary billet. Figure 40 shows that 60 percent of the Memphis instructors considered their supervisor as helpful. It is interesting to note that 30 percent of these instructors did not consider that their supervisors were of any use. This may be an indication of the caliber of the supervisors being used and not so much an indication of the worth of the supervisor billet. It is possible that a study of the caliber of supervision in Memphis schools would be worth while.

If the need for the supervisor is recognized, provision for him must be included when determining instructor requirements.

Source and Selection of Supervisors

Service school supervisors are procured from enlisted, officer, and civilian ranks. In Figure 41 it is shown that almost all of these personnel in Memphis are from the enlisted ranks.

In the majority of cases, supervisors are chosen from the best qualified and most senior instructors. In the

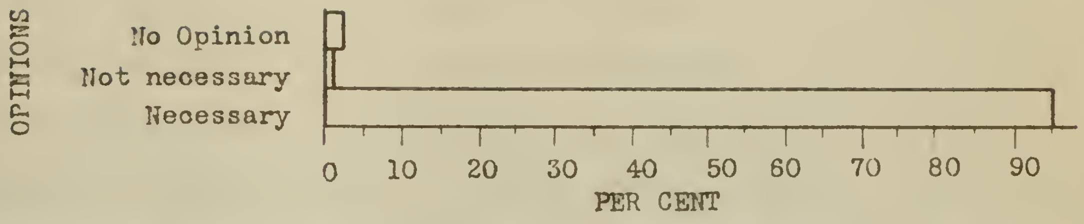

FIGURE 39. ADMINISTRATORS' RESPONSE TO QUESTION CONCERNING THE NECESSITY OF THE SUPERVISOR BILLET IN THE SERVICE SCHOOL

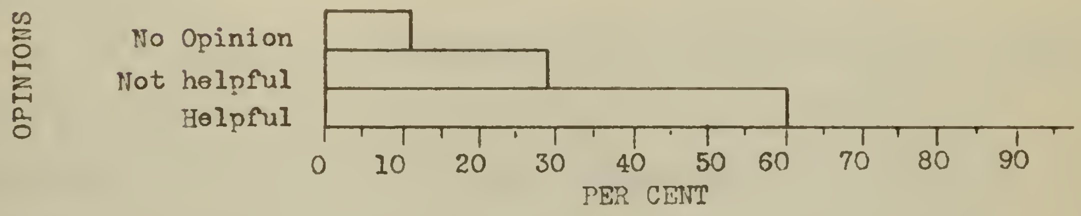

FIGURE 40. OPINIONS OF INSTRUCTORS CONCERNING THE HELPFULNESS OF THE SUPERVISOR IN IMPROVING THE TEACHING ABILITY OF THE INDIVIDUAL INSTRUCTOR

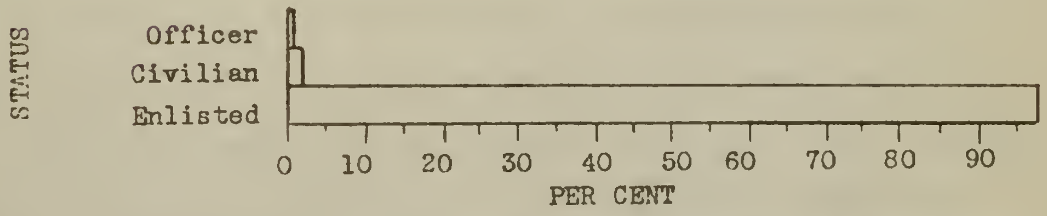

FIGURE 41. PROFESSIONAL STATUS OF SUPERVISORS SURVEYED IN THIS STUDY

selection of enlisted supervisors, it is common practice to confine selections principally to petty officers of the highest military rating. This seniority qualification sometimes carries more weight than ability to supervise, which is common practice in any military organization and probably does not make for the best supervisors, nor the best relationship between supervisors and instructors. In answering the questionnaire for this study, Memphis instructors volunteered several comments relative to the proficiency of their supervisors. Figure 42 shows that over 90 percent of the enlisted supervisors in Memphis are chief petty officers.

As in the case of the instructors, service school supervisors are frequently personnel who have not volunteered or requested such duty. In some cases they are dissatisfied with their work, although the percentage is not as great as in the case of the instructors. Figures 43, 44, and 45 show that over 50 percent of the supervisors at Memphis did not request or volunteer for instructor duty, that 15 percent did not like duty as instructors, and 5 percent do not care for duty as supervisors, even if it is under different conditions at another station. This general condition should be realized by top management personnel when considering the instructor problem of service schools.

Personal History of Supervisors

As naturally would be expected, supervisors usually are more mature, and more settled in their family life than

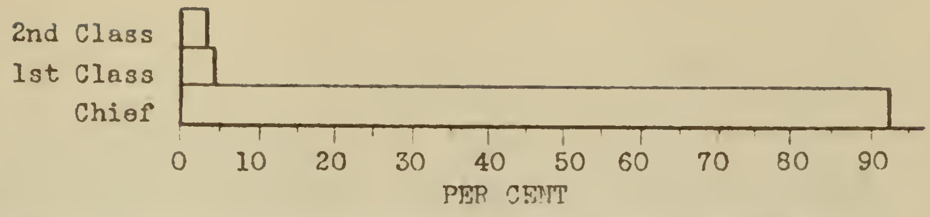

FIGURE 42. PETTY OFFICER STATUS (PAY GRADE) OF ENLISTED SUPERVISORS SURVEYED IN THIS STUDY

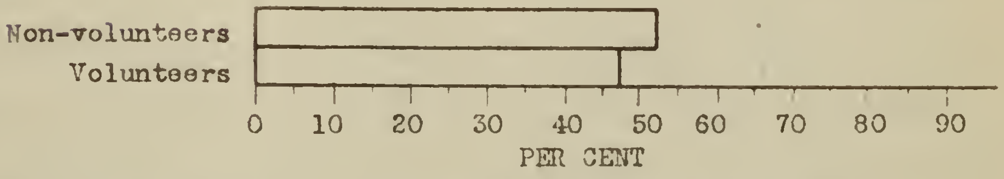

FIGURE 43. DISTRIBUTION OF VOLUNTEERS AND NON-VOLUNTEERS FOR INSTRUCTOR DUTY AMONG SUPERVISORS SURVEYED FOR THIS STUDY

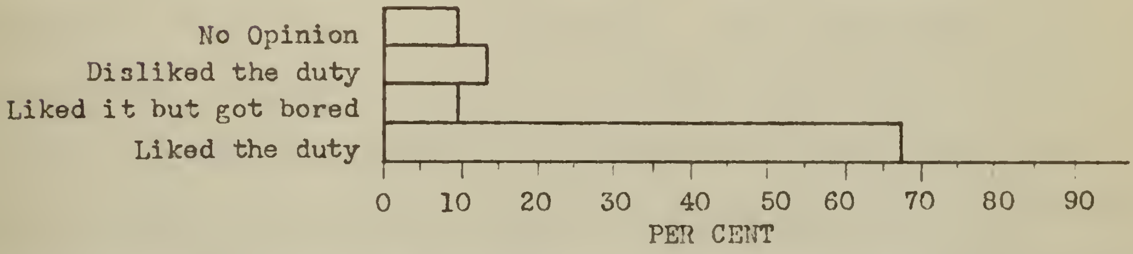

FIGURE 44. SUPERVISORS' RESPONSE TO QUESTION CONCERNING DESIRABILITY OF INSTRUCTOR DUTY

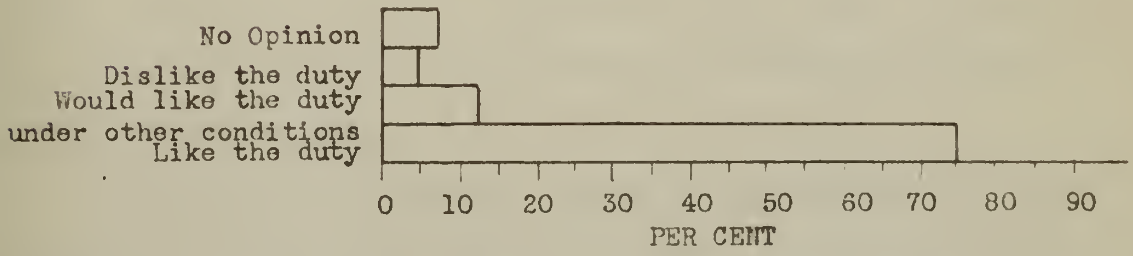

FIGURE 45. SUPERVISORS' RESPONSE TO QUESTION CONCERNING DESIRABILITY OF SUPERVISOR DUTY

instructors. Figures 46, 47, 48, and 49, show the status of Memphis supervisors. A comparison with Figures 11, 12, 13 and 14 (p. 23), indicates that there is about a five year spread in age, a four year spread in amount of service and considerable difference in number of dependents between instructors and supervisors.

Here again, as in the case of the instructors, there are differences among personnel in different schools. For example, in Figures 50 and 51 it is shown that supervisors in the Electronics Schools are considerably younger and have far less federal service than their contemporaries in the Machinist Schools. The management must consider the nature of the supervisory personnel for a particular school when thinking of instructor requirements. The more mature the supervisor, the better the supervision should be, and the fewer the number required. A school operating with less experienced personnel may have to have more supervisors to make up for the lack of talent.

Qualifications of Supervisors

The general attainments of service school supervisors prior to reporting for instructor duty had been discussed under "Qualifications of Instructors" (p. 30). Figure 15 (p. 34) shows the main qualifications which the Memphis supervisors attained.

In general no specific amount of experience as an instructor is required before a man may be designated as a supervisor of instructors, the supply and demand situation again being the principal determinant. It seems logical

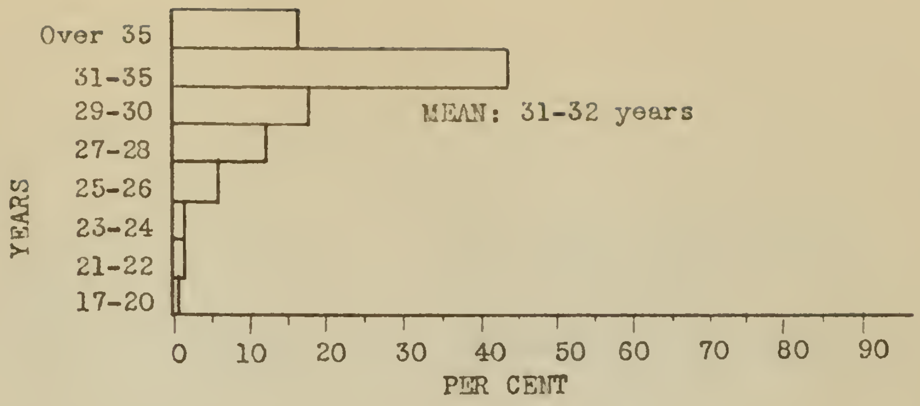

FIGURE 46. AGE DISTRIBUTION OF SUPERVISORS SURVEYED FOR THIS STUDY

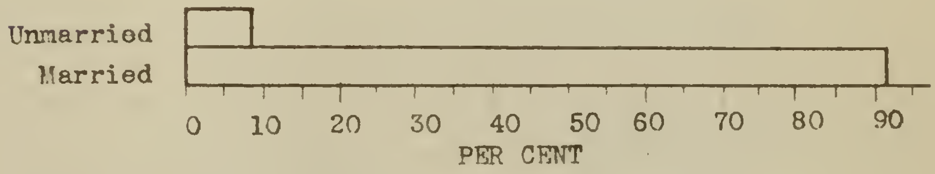

FIGURE 47. MARITAL STATUS OF SUPERVISORS SURVEYED FOR THIS STUDY

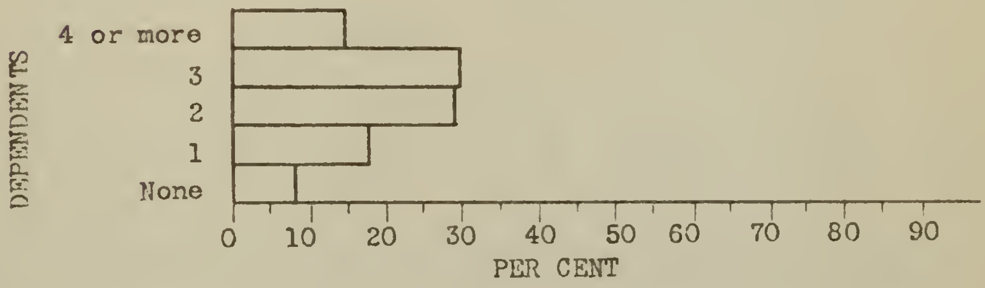

FIGURE 48. DEPENDENCY STATUS OF SUPERVISORS SURVEYED FOR THIS STUDY

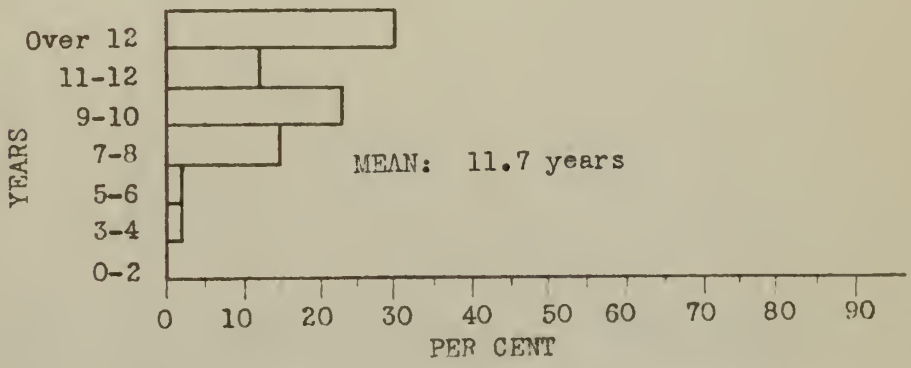

FIGURE 49. YEARS OF FEDERAL SERVICE BY SUPERVISORS SURVEYED FOR THIS STUDY

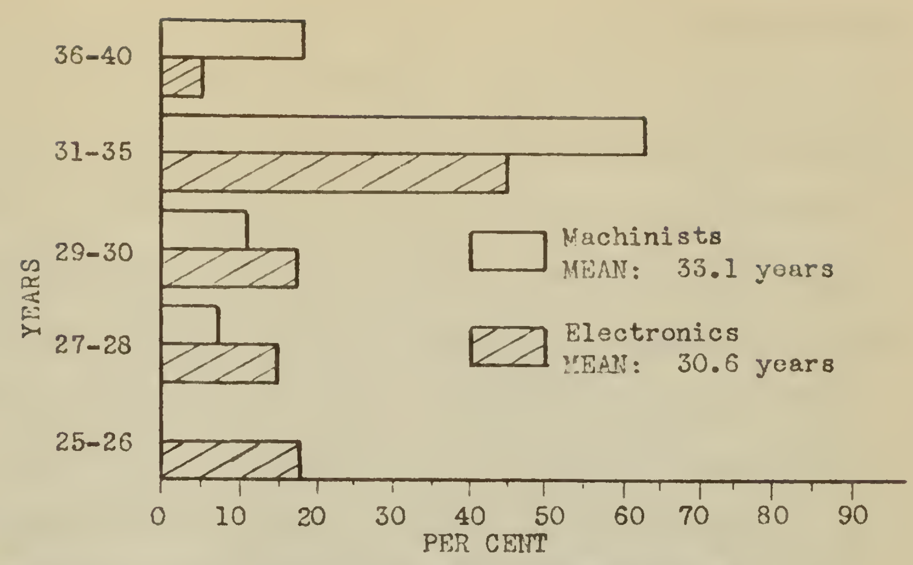

FIGURE 50. COMPARISON OF AGE DISTRIBUTION OF ELECTRONICS AND MACHINIST SUPERVISORS

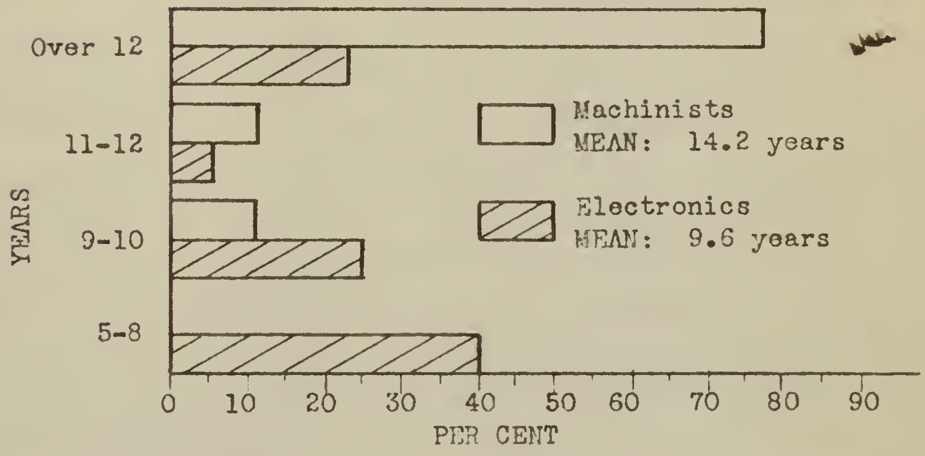

FIGURE 51. COMPARISON OF FEDERAL SERVICE BY ELECTRONICS AND MACHINIST SUPERVISORS

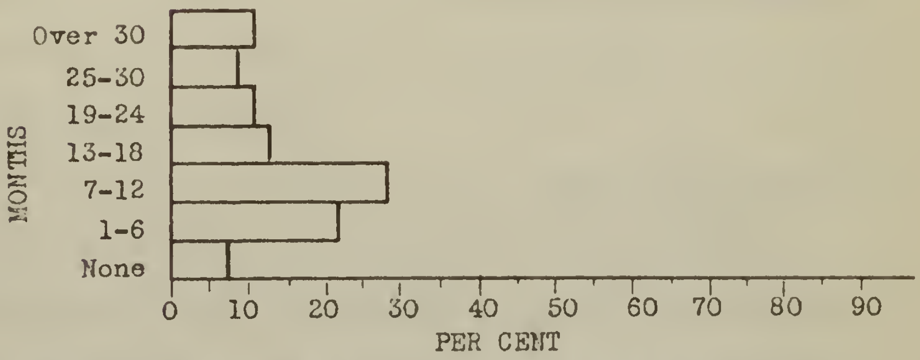

FIGURE 52. SUPERVISORS' RESPONSE TO QUESTION CONCERNING PREVIOUS FORMALIZED TEACHING EXPERIENCE PRIOR TO RECEIVING AN ASSIGNMENT AS A SUPERVISOR

to assume that supervisors should have as much teaching experience as possible prior to being assigned as supervisors of instructors. However, the situation among Memphis schools does not bear out this statement as indicated in figure 30 where it is shown that over 37 percent of the supervisors had less than one year of teaching experience prior to being assigned to supervisor duty. Exactly how much effect seniority in military rating has over teaching experience in choosing supervisors is hard to say, but it appears that it is considerable. Of course, it may very well be that the best qualified supervisors are not necessarily those with the most teaching experience, in which case leadership ability is probably the principal determinant.

In any case, as has been mentioned earlier, the qualifications and ability of the supervisory force available for assignment to a particular school is a factor in determining the number of instructors required for that school.

Training of Supervisors

The necessity for specialized training of supervisors has been discussed earlier.[1] It is necessary and must be considered in figuring instructor requirements.

Duties of the Supervisor

The general nature of the service school supervisor's duties is similar to that of any first line supervisor. He is responsible for the performance of duty of certain instructors. There seems to be some disagreement on the

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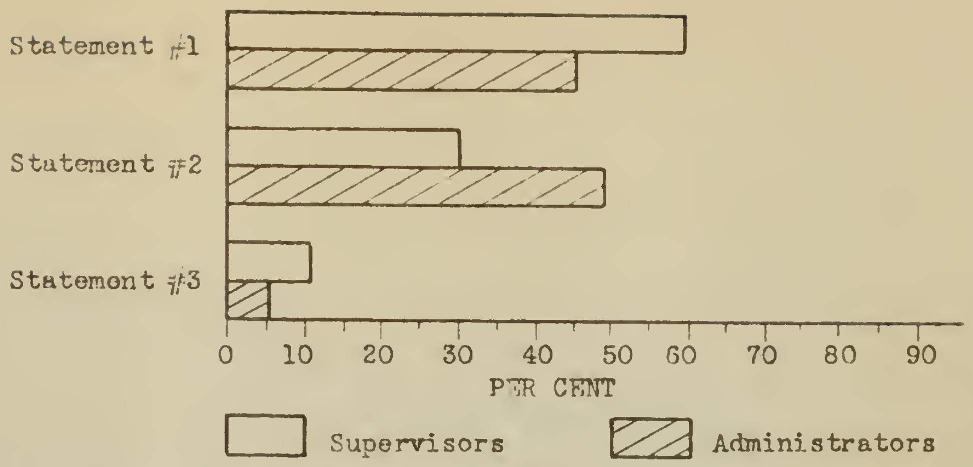
[1] Supra, pp. 36-9.

question as to whether or not the supervisor should be required to perform some instructional duty in addition to the work connected with his supervisory capacity. School administrators in Memphis seem to be about equally divided on the question, while the supervisors somewhat favor complete freedom from instructional duties except in emergencies or for demonstration purposes as indicated in Figure 51. The latter opinions may be somewhat influenced by the fact that over 75 percent of the supervisors are required to act in an instructor capacity in addition to their supervisory duties, as indicated in Figure 52.

In the performance of the supervisory work, there is again considerable disagreement on the question as to where the emphasis or attention shall be placed. Whether to concentrate on weaker instructors or to work with the better instructors in the hope that the weaker will benefit indirectly is a question which has bothered supervisors in all types of schools, and service school personnel seem to be no exception to the rule. Figure 53 shows that there is so general agreement on the subject, that some middle road is probably the answer. Of course, opinions of personnel at Memphis may be influenced by the nature of the instructors or the supervisors. In some school which is struggling to keep in operation, natural emphasis of supervision would probably be on the weaker instructor, whereas in the school which is manned by competent personnel and in good operating condition, a more long range approach to the supervision problem may be used. At any rate, the nature of the duties



Statement #1: Supervisors should devote their total time to the supervision of other instructors and should not be required to do any actual instructing except as demonstrations or in emergencies.

Statement #2: Supervisors should have regular instruction duties in addition to their supervisory duties although the number of classes they handle should be less than that for regular instructors.

Statement #3: Neither of the above statements represents my opinion.

FIGURE 53. RESPONSE OF ADMINISTRATORS AND SUPERVISORS TO QUESTION CONCERNING EMPLOYMENT OF SUPERVISORS

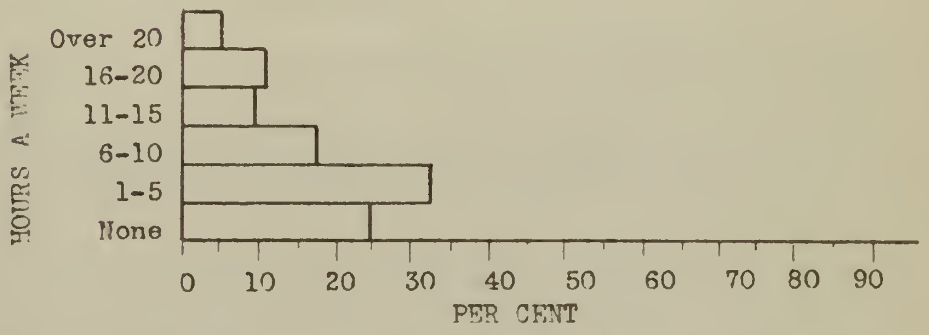
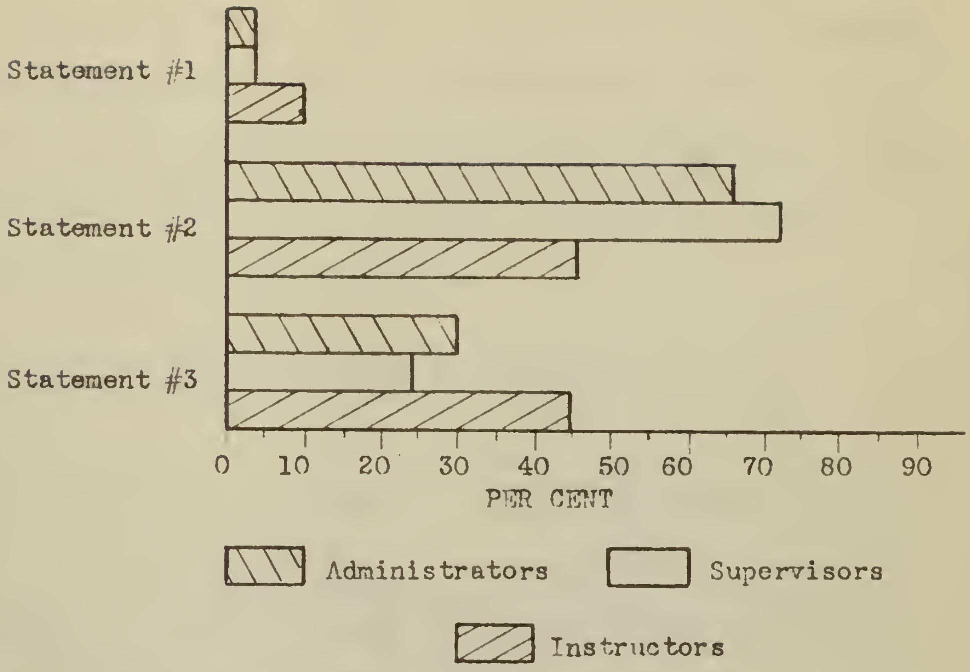


FIGURE 54. SUPERVISORS' RESPONSE TO QUESTION CONCERNING AVERAGE HOURS A WEEK DURING WHICH THEY ARE ACTUALLY ENGAGED IN TEACHING STUDENTS



Statement #1: Supervisors should devote the majority of their supervisory time to qualified instructors who are receptive to their suggestions in the hope that the weaker instructors will benefit indirectly and be inspired by observing the results which better qualified instructors are obtaining.

Statement #2: Supervisors should devote the majority of their time to the weaker instructors, even though they may not be too receptive to suggestions.

Statement #3: Neither of the above statements represents my opinion.

FIGURE 55. RESPONSE OF ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS TO QUESTION CONCERNING THE EMPLOYMENT OF SUPERVISORS

of the supervisor must be considered when deciding on instructor requirements. If the school is in good operating condition, manned with competent personnel, and the supervisors can devote considerable time to actual instructor duties, fewer instructors will be required. On the other hand, when a school is newly established or suffering from inexperienced and incompetent instructors, the supervisors must devote more time to the supervisory task. Hence, more instructors will be required.

Time Lost by the Instructor and Supervisor

General

There are several elements of lost time which cause the instructor and supervisor to be absent from duty, for which adequate compensation must be made in setting the instructor requirement for any school.

Sickness

It is readily understandable that if instructors or supervisors are incapable of reporting for duty by reason of sickness, someone must replace them and perform their duties. Instruction cannot stop and wait for their return to the job. This is particularly true in the service school where each instructor supplies a certain amount of material which must be given in the proper sequence in order that the student will be qualified to proceed on to the next unit or phase of the course. Although many administrators in the Memphis schools felt that this problem was of no particular concern, others felt differently as indicated in Figure 56.

The exact amount of time lost because of this factor will be discussed in Chapter V. The geographical location of the service school will undoubtedly have a great effect on the time lost due to sickness but regardless, this factor must be considered in computing instructor requirements.

Disciplinary Action

Because of the general caliber of the instructor and supervisor in the service school, the disciplinary problem should be of little importance. Any time that is lost by the instructor or supervisor is probably more often due to the fact that he must appear as a witness in a case, rather than as the defendant. This fact seems to be substantiated by the study of Memphis personnel. As indicated in Figure 57, almost none of the school administrators considered this a noticeable problem. The exact amount of time lost by Memphis personnel due to this reason will be discussed in Chapter V.

Although this problem seems to be of little significance, should the caliber of instructional personnel drop to a level of concern, adequate provision would be required in the number of instructors allotted to the individual school or command.

Annual Leave

Present regulations in the Armed Services require that all service personnel be granted 30 days vacation each year with pay, if the personnel desire such leave of absence. Furthermore, service personnel are allowed to let this leave accumulate over a period of time, the maximum amount

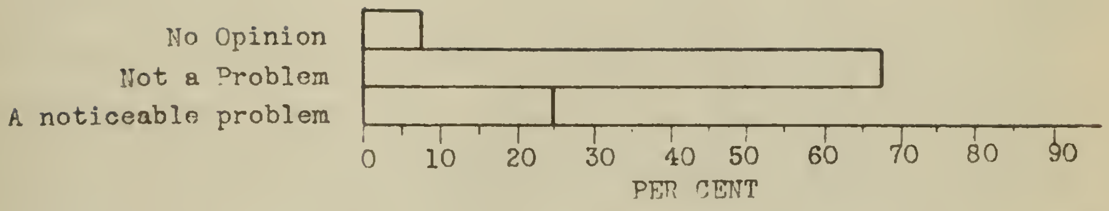


FIGURE 56. ADMINISTRATORS' RESPONSE TO QUESTION CONCERNING THE IMPORTANCE OF LOST TIME DUE TO SICKNESS AND HOSPITALIZATION OF INSTRUCTORS AND SUPERVISORS

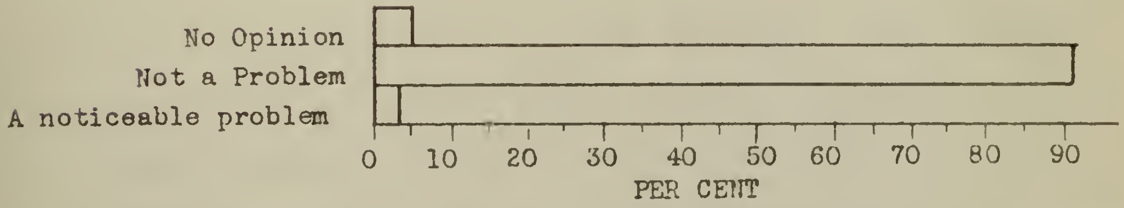


FIGURE 57. ADMINISTRATORS' RESPONSE TO QUESTION CONCERNING THE IMPORTANCE OF LOST TIME DUE TO DISCIPLINARY ACTION AS A SCHOOL PROBLEM

accrued not to exceed sixty days. In the Navy, commanding officers unable to grant such leave to personnel who desire it, are required to explain reasons to the Bureau of Personnel. It is quite common practice for commissioned officers to forego some of the leave and disregard the matter. However, such is not the case with enlisted personnel. Planning personnel in the service manpower field can count only on a maximum of eleven months productivity from the enlisted ranks per year. Positive compensation for this fact must be made when establishing the instructor allowance for any school. Additional personnel must be assigned to make up for this lost time.

Time in Transit

The last element of lost time is that concerned with the time which the instructor or supervisor spends in transit between his old duty station and the station where he will be employed as an instructor or supervisor. This element may or may not be of concern when computing instructor requirements depending on the procedure used in accounting for personnel. If the new candidate is charged to the service school as of the date he is detached from his old duty station, compensation for the time in transit must be made since the man is counted on the personnel rolls of the school and yet is not available for duty in that school. This time in transit may vary from one to over thirty days, depending on the distance and mode of travel that is used. If, however, the personnel accounting procedure does not charge the service school with the new candidate until the

duty is reported for instructor duty, the problem is of no concern in setting up an allowance of instructors for the school.

Length of the Instructor Duty Tour

This length of the instructor duty tour is of no concern in the case of civilian instructors since they are essentially career teachers and employed in special teaching situations. It is of little concern in the case of officer instructors since they receive personalized detailing to their duty assignments in accordance with a career management plan.

In the case of enlisted personnel, however, this problem has many complications. The situation varies from school to school and with the technical specialties of the personnel involved. In the Navy, the principal determinant is again the aspect of supply and demand. If a large number of personnel desire duty as instructors and are awaiting such assignment, the length of the duty tour for personnel acting as instructors will probably be relatively short, in order to give others an opportunity for such assignments. On the other hand, if it is extremely difficult to procure enough instructor volunteers in some particular specialty, instructors in that specialty will be required to remain as instructors for longer than normal tours of duty. In non-aviation elements of the Navy for instance, there is high motivation on the part of personnel to request instructor duty since it means an assignment ashore instead of at sea. As a result the supply of volunteer instructors is not critical, and the duty tours can be fairly well regulated. In aviation,

however, there is little motivation of this nature since the majority of aviation billets are shore based anyhow. Consequently, the tours of instructor duty in aviation technical schools vary considerably, but may be quite long in view of the small number of requests for such duty that are received. As an example of this fact, the normal tour of shore duty for enlisted personnel of the Navy is two years. Yet over 10 percent of the Memphis instructors had been assigned to instructor duty for longer than two years as illustrated in Figure 17 (p. 52). This does not include supervisors who would undoubtedly increase the percentage considerably in view of the fact that they are the more senior and experienced personnel. Figure 30 shows that over 29 percent of the supervisors had been acting in a supervisory capacity for longer than two years, which does not include their previous time as instructors. An indication of the real tour length for all instructors and supervisors of the Naval Air Technical Training Command is given in Figure 33. This figure shows the actual number of months which 113 instructors and supervisors had accumulated during their tour ashore before being transferred from the Command. These 113 men were all of the instructor or supervisor personnel transferred from the Command during January and February 1956, excluding personnel hospitalized or those classified as unqualified for the duty. The large standard deviation shows that there is no set policy on how long a tour of instructor duty shall last.

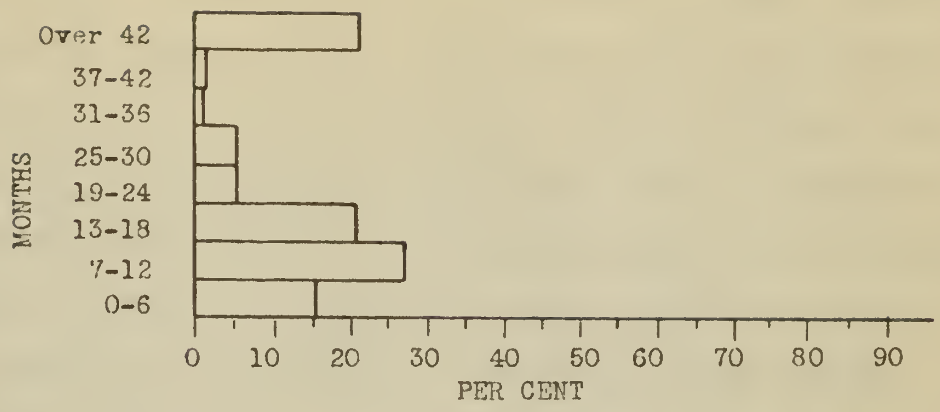


FIGURE 58. SUPERVISORS' RESPONSE TO QUESTION CONCERNING TOTAL AMOUNT OF SUPERVISORY EXPERIENCE ATTAINED BY EACH SUPERVISOR

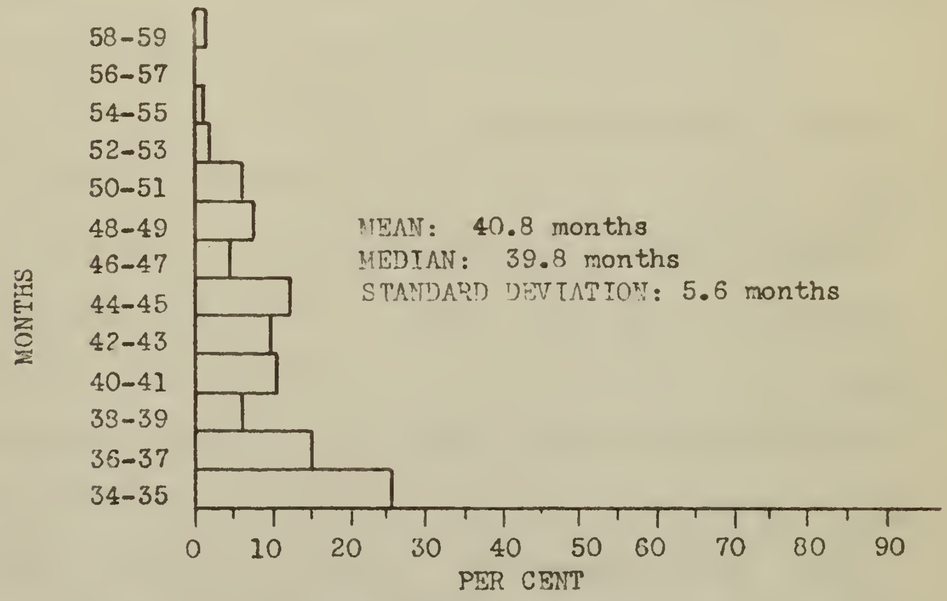


FIGURE 59. TOTAL MONTHS ASHORE ACCUMULATED BY INSTRUCTORS AND SUPERVISORS OF THE NAVAL AIR TECHNICAL TRAINING COMMAND PRIOR TO TRANSFER TO OTHER DUTY (DATA FOR PERSONNEL TRANSFERRED DURING JANUARY AND FEBRUARY 1950)

There seems to be considerable agreement on the part of the instructors and supervisors in Memphis that the tour of instructor and/or supervisor duty should last longer than two years. Over 66 percent of the instructors and 77 percent of the supervisors were in favor of such a tour as indicated in Figure 60. It is particularly significant that 35 percent of the instructors felt that the tour should last over three years.

Several volunteered comments on this question stating that they believed a professional instructor corps should be established, and that personnel liking the duty be allowed to remain in an instructor capacity permanently. Such a procedure would be impractical, however, if the fundamental policy of keeping the instruction correlated with the equipment used by the operating forces is to be followed.

One possible answer that was suggested seems to have merit in view of the varying opinions on the subject. Several commented that the length of the tour should depend on the individual concerned. If the instructor continued to be motivated for the work, and was performing his duties in a satisfactory manner, consistent with the standard of instruction desired, he should be allowed to remain on the duty until he requested a change. If on the other hand, he did not desire the duty, he should be allowed to move on as soon as possible.

The significance of this problem for top management is similar to that concerned with any labor turnover problem. After investing considerable time and money in training the individual to perform a certain job, a great deal is lost

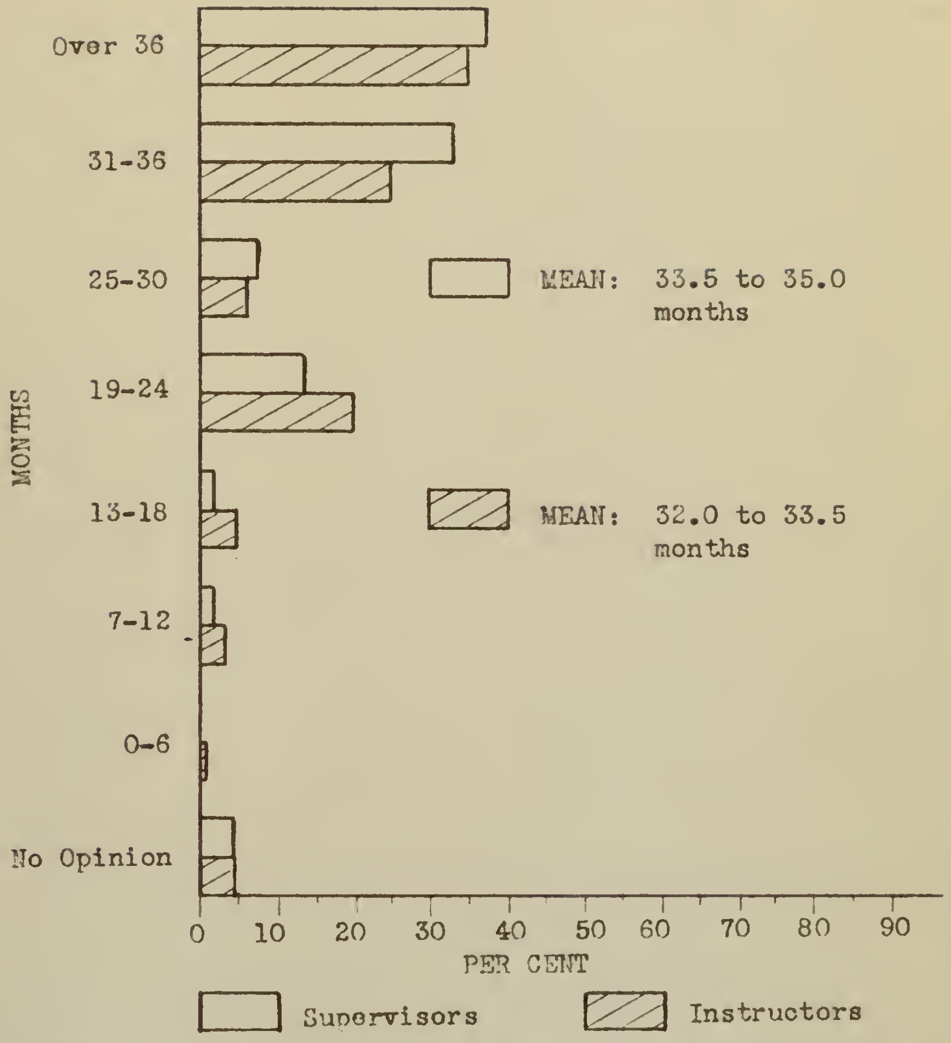


FIGURE 60. RECOMMENDATIONS OF SUPERVISORS AND INSTRUCTORS CONCERNING THE IDEAL LENGTH OF A TOUR OF INSTRUCTOR AND/OR SUPERVISOR DUTY

if the man quits the job or is moved on to another before he has contributed a certain amount of return on the training investment. Removing the service school instructor before he has reached the peak of his efficiency and contributed his maximum effort to the school is a waste of time and money. Furthermore, it requires more instructor personnel on the job, since more personnel are needed to make up for the less efficiency of the incumbents. The better qualified the service instructor, the fewer the number who will be required. From the study of the Memphis instructors, it would seem that a three year tour is of some significance. Regardless of the length decided upon by top management, the problem is one which must be considered when deciding the instructor strength of the school concerned.

The Administrator

Since the administrative force charged with the responsibility for the operation of any enterprise is often the key element in the efficiency and quality of performance of that enterprise, the nature of the administrative force charged with the operation of the service school must be considered in determining the instructor requirements for that school.

Administrators for service schools are principally commissioned officers, supported by certain technical experts and professional educators in an advisory or assistant capacity. Figure 61 shows the status of administrators in the Memphis schools, and Figure 62 illustrates the various billets to which they are assigned.

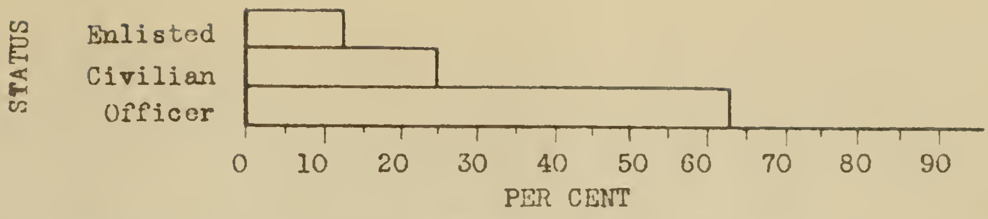


FIGURE 61. PROFESSIONAL STATUS OF ADMINISTRATORS SURVEYED IN THIS STUDY

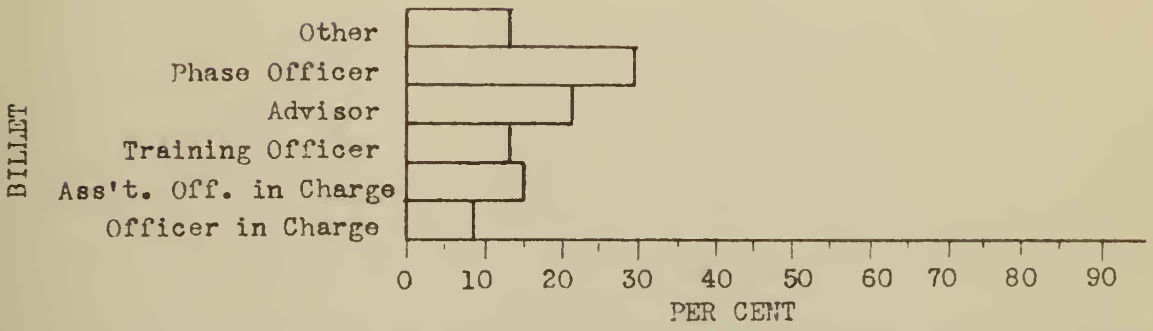


FIGURE 62. BILLET ASSIGNMENT OCCUPIED BY ADMINISTRATORS SURVEYED IN THIS STUDY

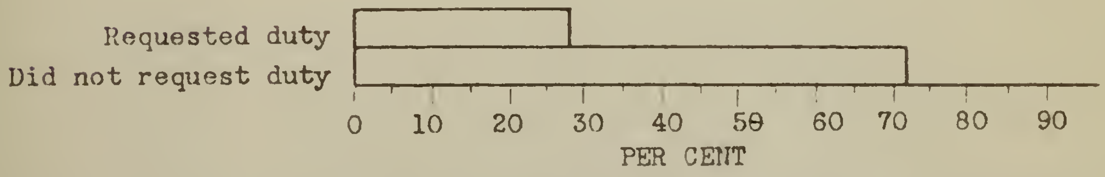


FIGURE 63. COMMISSIONED OFFICER ADMINISTRATORS' RESPONSE TO QUESTION ASKING IF THEY VOLUNTEERED FOR, REQUESTED, OR SOUGHT DUTY AS SCHOOL ADMINISTRATORS

Civilian administrative personnel are selected in accordance with Civil Service Regulations to fill a specified billet which the service school feels is required. Enlisted administrative personnel are usually selected from among the instructor and supervisor personnel. Officer personnel are detailed to the service school command in accordance with the needs of the base and the availability of such personnel. In the Navy, assignments are based on either technical competence in some specialty or on administrative ability which every officer is supposed to possess.

It is interesting to note from Figure 63 that less than 30 percent of the commissioned officers in the administrative force of the Memphis schools volunteered for or sought this duty. Furthermore, less than 45 percent of these officers had ever had any previous experience as a teacher or instructor, as shown in Figure 64. Even so, 75 percent of them stated that they like the duty which is illustrated in Figure 65.

Figures 66, 67, and 68 show the general age level, amount of federal service, and school administrative experience of the combined group of administrators in Memphis, indicating that although they have had considerable experience in the military service, not much of it has been in connection with school systems.

It can be seen that the nature of the administrative officer must be born in mind when considering the size of the instructor force. Experienced administrative personnel will be able to accomplish the job with less assistance and

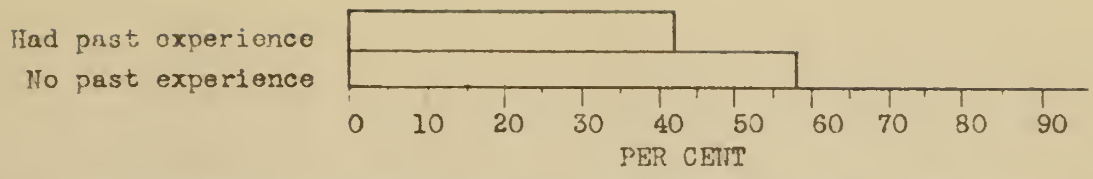


FIGURE 64. COMMISSIONED OFFICER ADMINISTRATORS' RESPONSE TO QUESTION CONCERNING PREVIOUS EXPERIENCE AS A SCHOOL TEACHER OR INSTRUCTOR

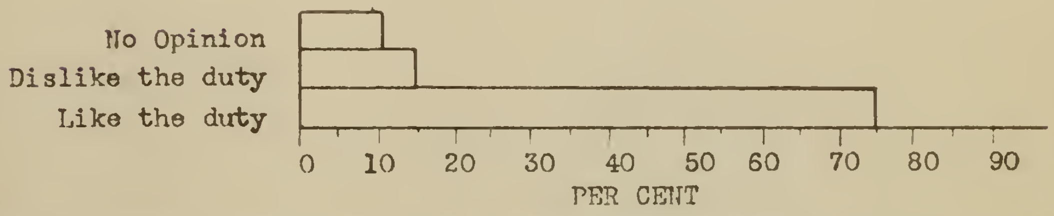


FIGURE 65. COMMISSIONED OFFICER ADMINISTRATORS' RESPONSE TO QUESTION CONCERNING DESIRABILITY OF SCHOOL ADMINISTRATOR DUTY

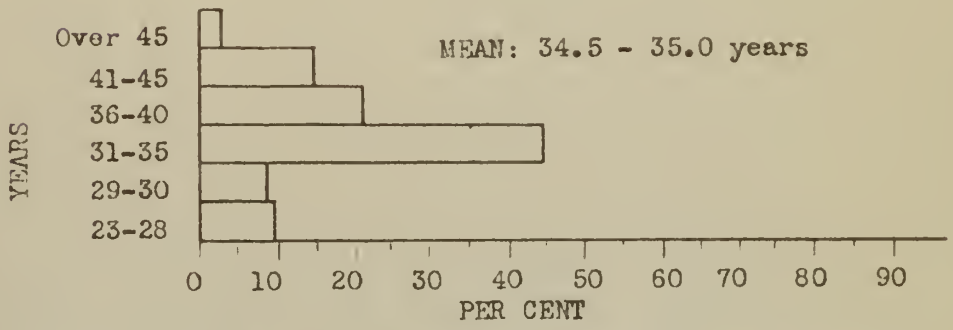


FIGURE 66. AGE DISTRIBUTION OF ALL ADMINISTRATORS SURVEYED FOR THIS STUDY

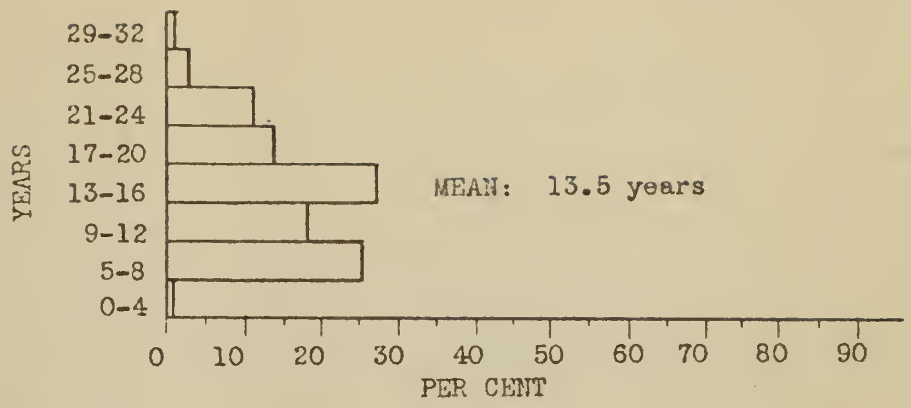


FIGURE 67. YEARS OF FEDERAL SERVICE BY ADMINISTRATORS SURVEYED FOR THIS STUDY

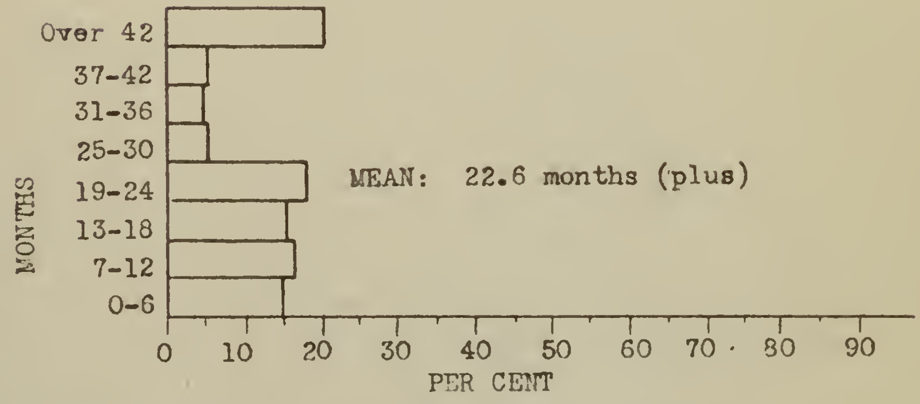


FIGURE 68. ADMINISTRATORS' RESPONSE TO QUESTION CONCERNING TOTAL AMOUNT OF SCHOOL ADMINISTRATIVE EXPERIENCE ATTAINED BY EACH ADMINISTRATOR

hence fewer instructors will be required. On the other hand, if the service school must be staffed with individuals who are inexperienced and who do not desire the duty involved, compensations in the form of more personnel will probably be required, although some of their time frequently will be wasted.

The Student

One of the most important factors in any problem dealing with schools is the student. In the instructor requirement problem the aptitude of the student for learning (his ability to comprehend the material which is presented) is a main point of concern. The better the student, the less individual attention he will require and the fewer the instructors who will be required by the school. The management must take this point into consideration when determining the size of the instructor force. It will take more instructors to train students with poor capabilities than it will to train an equal number of students with much aptitude for learning. In some instances, the capabilities of the student may be of such a nature that the curriculum and course of study should be changed to fit the capabilities. The student with great aptitude will require less time than the poorer student to complete the same amount of material. Depending on the capabilities of the student, it may be advisable to lengthen or shorten the course of study. Any adjustment in the course of study which affects the instructional hours needed to complete the material will affect the size of the instructional staff.

Furthermore, the capabilities of the student may warrant a change in the number of students assigned to any instructor. Any change in the load which the instructor must handle immediately affects the size of the instructional force.

The required aptitude for learning will be different for different schools, depending on the difficulty of the material in the course of instruction for the school in question.

Entrance requirements for admittance to individual schools generally are established for the level of difficulty of that school. Even so, consideration of the aptitude of the student must be allowed since variations in entrance requirements will not equalize the instructional problem in all of the schools. Figure 69 illustrates the opinions of the administrators, supervisors, and instructors of the Memphis schools relative to the qualifications of the students for learning everything offered by the course of instruction. It is noted that approximately 30 percent of these personnel did not consider the students so qualified. In Figure 70, however, it is shown that opinions vary from school to school in that students in the electronics schools were not considered to be nearly as well qualified as students in the machinists schools. Whether or not the student in any school should be qualified to learn everything presented in that school is a matter of no importance in this study. The fact that abilities do vary from school to school is important however, and must be considered in the study of the instructor requirement problem.

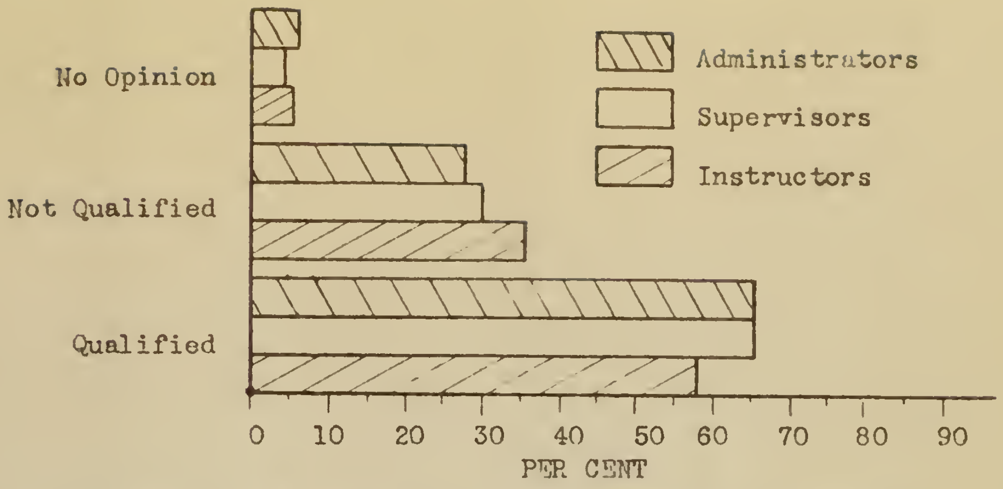


FIGURE 69. OPINIONS OF ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS RELATIVE TO QUESTION CONCERNING QUALIFICATIONS OF AVERAGE STUDENT TO LEARN EVERYTHING OFFERED BY THE COURSE OF INSTRUCTION

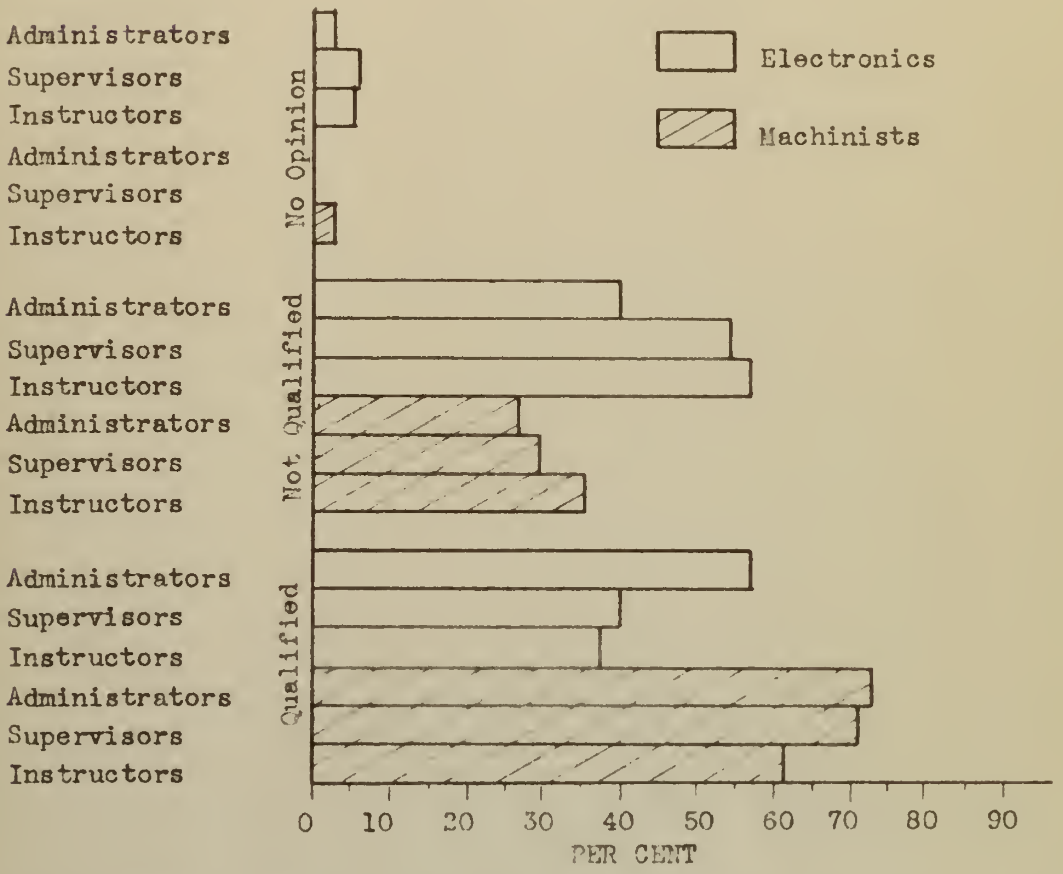


FIGURE 70. COMPARISON OF OPINIONS OF ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS IN ELECTRONICS AND MACHINIST SCHOOLS RELATIVE TO QUESTION CONCERNING QUALIFICATIONS OF AVERAGE STUDENT TO LEARN EVERYTHING OFFERED BY THE COURSE OF INSTRUCTION

Geographical Location and Physical Conditions of the Plant

The effect of the geographical location and physical conditions of the school plant on the standard of instruction is of great concern. As pointed out in the survey of the Adjutant General's School, Camp Lee, Virginia, "a good location and an adequate and proper physical plant for the School are fundamentally important inasmuch as they either facilitate or interfere with the conduct of the training mission."[1] The survey commission further pointed out that the nature and training mission of a school might require a location readily accessible to outside resources which can be utilized in developing units of instruction. Such resources might be universities, industrial plants, or business concerns. Location near a large metropolitan area would provide many such resources.[2]

The choice of the geographical locations for large military establishments is influenced by many factors such as politics, strategic and tactical values, convenience, economy, and availability. With the many pressures that are brought to bear on top management in the selection of sites for their service schools, it is not always possible to pick the best location for the training mission of the school. When the location of a base is such that the training mission is jeopardized, this fact should be considered by top

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1. The Adjutant General's Office, *op. cit.*, p. 15.

2. *Loc. cit.*

management in determining the size of the instructional force that will be required.

Many of the elements of geographical location affect the motivation and selection of instructor personnel for schools. Schools located in areas where the climate is good, housing is available, and opportunities for cultural education and entertainment are present, will find motivation of instructor personnel an easy problem. Furthermore, the problem of procuring volunteer personnel for instructor duty will be eliminated since 'good duty' stations are always sought by personnel. In the Navy, it is common practice for enlisted men ordered ashore for a tour of duty to take advantage of an option to refuse such shore duty in the event that they are not satisfied with the assignment. Many refusals are made because the personnel are dissatisfied with the geographical location of the station to which they have been ordered. When a school is located aboard a 'good duty' station, the instructor personnel will be some of the best personnel available for such duty, merely because they want to be located on that station. Schools which are not so fortunate in their location have many additional problems and obstacles thrown in the path of the training mission, merely because of the geographical location. Allowance for this fact must be considered in setting the instructor allowance for such schools.

The arrangement of the school buildings also is important. This point was well made in the criticism of the Adjutant General's School by the Survey Commission:

> There are too many small separate buildings scattered over a relatively large area, each devoted to some discrete aspect of the School's activities. Fewer and larger buildings would make for more efficient operation and for more effective administration and supervision of the various activities. Also, if they were conveniently grouped, reduction in time spent by personnel in traveling among buildings would effect a material saving in man hours of time which are devoted now to such traveling.[1]

Lost man hours by students and instructional personnel spent in traveling between activities does not improve the instructor requirement problem. With more inefficiency of arrangement of buildings, more instructors are required.

The physical capacity of the school rooms is of some concern. If the subject material in a particular phase is of such nature that fifty students could be assigned to one instructor, a room large enough to handle this number must be available in order to take advantage of this condition. If, however, the rooms will handle only twenty-five students, two instructors will then be required to do the same job in the same amount of time. Capacity of instructional spaces must be considered when computing the instructor requirements.

The material condition of the school plant also has a great deal to do with the standard of instruction which will be attained and hence has an effect on the number of instructional personnel who will be required. Run down buildings, with poor heating facilities, poor lighting, and poor ventilation, do not make the instructional job any easier. The effect is such that smaller instructor/student ratios must

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[1] The Adjutant General's Office, *op. cit.*, p. 17.

be used in order to get the material across, and hence more instructors are required to complete the same job.

Summation of the Problem Analysis

The problem of computing instructor requirements for a service school contains many variables which must be considered separately for the individual school concerned. The unique method of presenting the material, based on the assembly line technique of modern industry, must be kept in mind when considering any of the variables.

The length of the course of instruction and the nature of the material in the course affect the number of instructors required. If more units of material are added or if the difficulty of the material is increased, more instructors will be required.

The size of the student input quota is a factor involved since it has an effect on the size of the student body which in turn controls the number of instructors required.

The frequency of input of the student load (the convening dates for new classes) is important since it also controls the size of the student load. In addition, the more frequent the convening dates, the fewer the number of units which an instructor can teach. Therefore, more instructors will be required. There is an optimum frequency of input for each school, for if new classes are not convened often enough, some instructors who are qualified to teach only a small section of the course, will find themselves sitting with nothing to do for several days at a time.

The instructor is an important factor to be considered. If a school is forced to operate with instructor personnel who have been selected for such duty against their wishes, instructors who do not like the type of work, personnel without adequate experience in their technical specialty, instructors who are immature and irresponsible, and instructors without proper qualifications for such duty, that school cannot be expected to fulfill its training mission unless additional personnel are assigned to make up for such deficiencies.

Furthermore, adequate time must be allowed for the training of instructors in teaching techniques and principles of supervision. Time must be allowed for indoctrination into the school system. Frequently it is necessary to increase an instructor's technical competence before he is placed in front of a group of students. This requires time. In addition more training time is required during a tour of instructor duty in order that the instructor can become qualified to teach new phases and units of the course material. This added time will help to control fatigue and boredom which are products of the service school instructional technique. Provision for special factory training must be made since this is frequently the only practical means of gaining acquaintance with new equipment destined for the operating forces.

The manner in which the instructor is utilized affects the instructor requirements for any school. The number of hours in a week which an instructor can efficiently devote

to the presentation of the material to the student, time required for lesson preparation, repair and construction of instructional aids, extra instruction for certain students, revision of the course of study and curriculum, review of student homework, and miscellaneous military duties must all be considered as part of the instructor work load and will therefore affect the number of instructors required to perform the training mission.

Since the supervisor is included in instructor requirements, provision for him must be made in arriving at an instructor allowance for a particular school. His background, qualifications, experience, training, and utilization must also be considered, just as in the case of the instructor.

Time lost by the instructor and supervisor due to sickness, disciplinary action, annual leave, and travel between stations will affect the number of instructors required since provision for adequate replacement must be made.

The length of the instructor duty tour has an effect. Removal of personnel from instructor duty before they have reached their peak of efficiency is wasteful of the time and money spent in training them for such duty. With fully proficient instructors on the job, fewer numbers will be required, and additional savings in manpower will be created.

The characteristics of the school administrator will have an effect on the efficiency of the school and hence on the number of personnel required in the instructional force.

The abilities and aptitudes for learning possessed by the students in the school will influence the size of the instructional force. Better qualified students will require less instructional staff, less training time to cover material, and hence make possible a double saving in the number of personnel required.

The geographical location of the school plant will affect the ease with which the mission can be accomplished, and will influence both the qualifications of the instructional force and the motivation of the instructors and students. Hence, a station which is classified as "good duty" will require fewer instructors than one which is located in an undesirable area.

The arrangement of the buildings on the base where the school is located has an influence on the time that personnel can devote to the training mission. Therefore, the better the arrangement of the school, the more time there is available for the primary mission, and less personnel will be required to do the same job.

The physical capacity of the school rooms controls the maximum number of students which can be assigned to any one instructor, thereby influencing the number of instructors required.

The material condition of the school plant will affect the ease with which the training mission can be accomplished and hence affects the size of the instructional force.

All of these elements work together to control the number of personnel that must be assigned to the

instructional staff of any service school. No efficient and workable figure can be determined unless each element is considered separately. Slide rule planning or thumb rule determinations of instructor requirements positively will neglect the consideration of many of these elements of the problem.

CHAPTER III

PREVIOUS RELATED STUDIES

Civilian Studies

Many studies have been made in the past relative to the problem of the work load which each teacher should carry. The objective of most of these studies, however, has been to devise some method of measuring the work load in order that it can be equalized or compensated for among teachers of the same school system. These studies have been run on elementary, secondary, junior college, and college level institutions. Much of the information derived from such studies does not relate to the problem faced by the service school in view of the differences in methods of presenting the subject material to the student, and the nature of the background of service school instructors, supervisors, and administrators. The fact that much of the service school instructors' class preparation involves a duplication of preparation prohibits comparison of preparation time. The fact that the service school instructor is not a career teacher and must be trained continually in his specialty, prohibits comparison of teacher training requirements. The long summer vacation which civilian teachers customarily receive in comparison to the thirty day leave given to service school personnel eliminates the use of much information available in studies of civilian teaching loads.

There are certain factors in the two systems which can be compared, however, and for which information from civilian studies of teacher load is valuable. Douglass, who is one of the most publicized authors on the subject of teacher load, has pointed out:

> The units most commonly employed in measuring teaching loads are, in the order of their importance: (1) the number of sections, (2) the number of pupils, and (3) the number of free periods. It should be obvious that neither of these units taken separately is a satisfactory measure of the time required of instructors or of the teaching load. Since schools differ materially in the length of the class periods and in the length of the school day, the number of free periods is clearly not serviceable.[1]

Data on class size and the number of hours spent each day in the teaching capacity are of interest to this thesis.

In discussing past studies on teacher load, Douglass has stated that, "during the past quarter century the average teaching load in the high school measured in terms of sections taught has diminished from approximately six to approximately five daily."[2] He then offers as his opinion that:

> A teaching load of six sections daily should be regarded as a maximum to be avoided whenever possible, and an assignment of five sections daily should carry with it little or no study-hall or other extra-class duties. Where as much as an hour a day is given over to these or other cooperations, the load should be not greater than four daily sections. In other words, the daily teaching load, including cooperations, should not exceed the equivalent of five sections daily.[3]

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1. Harl R. Douglass, Organization and Administration of Secondary Schools, p. [illegible].

2. Loc. cit.

3. Loc. cit.

In discussing the problem of teacher load in their work, Koos[1] and associates pointed out that the North Central Association of Secondary Schools and Colleges had established a standard for the teaching load, stating that an average enrollment in the school in excess of thirty pupils per teacher shall be considered as a violation of the standard. The Association further recommended that the following standards be considered as norms: (1) pupil-teacher ratio, 25 to 1; (2) the number of classes taught by the teacher, 5 daily; and (3) the total number of pupil-periods per day, 150 per teacher.

The Conference of the National Commission on Teacher Education and Professional Standards summarized their views on the teacher's work week as follows:

> School week - Since classroom instruction is only one of the significant elements involved in effective teaching, time for other activities should be included in the total school week. In the light of sound educational theory, the total school week should not exceed forty hours, of which fifteen to twenty hours would be devoted to instruction. (A total school week of forty hours; it means a total load of school-related activities which can be carried successfully and without strain by the teaching staff within forty hours of time each week.) The rest of the school week is needed for such activities as the teacher's planning and preparation, individual pupil guidance, work with special interest groups, evaluation of educational outcomes, supervision of play and study periods, cooperative planning by teachers and administrators, conferences with parents, school public relations programs, and other tasks absolutely essential to good teaching.
>
> When the educational program requires more time than can be encompassed within the total school week of

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[1] Leonard V. Koos, et al., *Administering the Secondary School*, p. 300.

> forty hours, additional personnel should be added in order that all teachers may do their work efficiently.[1]

Several studies have been made concerning the relative achievement by students in small versus large classes. In a study of four large Chicago high schools involving 134 high school classes, Stevenson[2] stated that although the general opinion among educators was that the size of classes should be reduced, studies of achievement tended to show that the size of a class is not a determining factor. As a result of his study, he concluded that, "The results for high-school classes show in general that the small classes have a very slight advantage over the large class."[3] The mean size of the large classes studied was thirty-eight pupils and the mean size of the small classes was twenty pupils. Of further interest in this study was the conclusion that, "the average pupils obtained greater benefit from the small classes than did the bright or dull pupils."[4]

Substantiation of these conclusions seems to have been made in a study by Swan,[5] published by the University of Pennsylvania. Four subjects were studied, in a four year high

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[1] "Teaching Load as Related to Teaching Efficiency," *The Improvement of Teaching*, Report of the National Commission on Teacher Education and Professional Standards, National Education Association (Chapter IV), pp. 112-8.

[2] P.R. Stevenson, "A Study of the Relation of Class Size to Efficiency of Teaching," *Smaller Classes or Larger*, p. 122.

[3] *Ibid.*, p. 123.

[4] *Loc. cit.*

[5] E.H. Swan, Jr., *The Relation of Class Size and Selected Teaching Methods to Pupil Achievement*.

school in Pennsylvania, with two paired classes in each subject limited to twenty pupils in the small class and forty pupils in the large class. The general conclusion stated, "....that there was little difference in achievement of pupils in small classes as compared to that of pupils in large classes in the subjects studied."[1]

An excellent discussion of such studies has been given by Koos and associates wherein it was stated:

> A scientific approach to the problem has been made by many investigators and at all levels of instruction - elementary, secondary, and collegiate - but with inconclusive results. A finding common to many of these studies has been that such results as can be measured by objective tests or teachers' marks are about equally good in large sections and in small. While this outcome has been accepted by a few administrators as justification for increasing the size of classes, most of them have been unwilling to take such a step, feeling that the experiments have not tested for important educational objectives. The more thoughtful school leaders are now assigning teaching loads on the assumption that the size of class may well vary with the subjects, methods of instruction, abilities of teachers, and abilities of pupils."[2]

One of the most recent studies completed on the subject of student load is that by Murphy[3] wherein the results of questionnaires submitted to the head administrators of every senior high school district in the State of California were analyzed. The questionnaire provided space for reporting

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1. Ibid., p. 73.

2. Koos, et al., op. cit., p. 520-3.

3. Malcolm Price Murphy, "Teacher Load and Class Size in California Senior High Schools." Unpublished Doctoral Dissertation, School of Education, Stanford University, California, 1949.

[illegible]

[illegible]

> [illegible]

[illegible]

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1. [illegible]

2. [illegible]

3. [illegible]

mean class size in practice, maximum in practice, recommended average, and recommended maximum for the twelve major subject departments. Results of this study for the subject of industrial arts showed that the median answer for mean class size was twenty pupils. The median answer for maximum class size was twenty-four pupils.[1]

For all of the subjects combined, the administrators recommended, "that thirty was the desired size of class in the senior high school more often than any other one number. Out of one hundred and fifty-five recommendations, forty-three recommended an average (mean) size class of thirty; thirty-eight recommended a class of twenty-five, and twenty-five recommended a class of twenty."[2]

A second part of Murphy's questionnaire asked for reasons for recommendations of class size over or under thirty per class. A summary of the results of this part stated:

> In the summary of all schools, the reason given most often for recommending classes of less than thirty students was that they are too large for individual instruction. Sixty-three or thirty-five percent of the administrators checked this reason. However, the largest number favoring classes over thirty, twenty-five percent, checked the statement "subject matter easily adapted to class over thirty students."[3]

In reporting the results of answers relative to the number and length of classes taught by each regular teacher each day, the following information was given by Murphy:

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1. *Ibid.*, p. 129.

2. *Ibid.*, p. 83-4.

3. *Loc. cit.*

> The two extremes are 200 minutes and 391 minutes, the larger almost twice that of the smaller. The most common figure is 275 minutes for 30 schools, a total which corresponds with 5 classes of 55 minutes, each. The median number is 300 or 5 full clock hours. The middle 50 percent are between 275 and 330 minutes or between 4.58 hours and 5.5 hours. These figures must not be confused with the length of the school day; they make no allowance for preparation and the other required work before and after school or for the lunch period.[1]

It is not considered that studies relative to the problem of supervision in civilian school systems are applicable to the problem faced in the service school. The industrial nature of the service school instructional technique and the fact that the instructors are not career teachers, relates the service school supervision problem closely to that faced by industry. Many studies on this problem have been made in that field and the ratio of seven to ten workers per supervisor seems to be an almost unanimous choice. Petersen and Plowman have discussed this point as follows, in writing of the field of business management.

> The size of the supervisory personnel, in terms of the number of persons that compose it, tends to vary with the number of employees in a concern. Ten or less supervisory executives of all grades - excluding the department heads and their immediate assistants - for every one hundred workers is a fairly accurate rule-of-thumb.[2]

The authors continue their discussion by stating:

> More specifically, the extent of the supervisory level will depend not only upon the number of employees who must be supervised but also upon the geographical dispersion of the operations of the business and the character of the technical and mechanical

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1. *Ibid.*, p. 186.

2. Elmore Petersen and E. Grosvenor Plowman, *Business Organization and Management*, pp. 173-4.

> equipment used in its productive process . . . . . Often, therefore, the number of executives per one hundred employees is large when company operations are widely scattered.[1]

In discussing supervision in the merchandise business, Riggs considered the size of the supervisory force as the first point of concern. He states:

> The first (principle in the division of work) is the number of people that a supervisor can supervise efficiently. Here there is some slight difference of opinion; but all the real, time-tested authorities are a unity in holding that the maximum is between seven and ten. In our own institution, seven is regarded as the ideal figure, but in practice we have not hesitated to permit this to be increased to ten. As a matter of fact, we have even allowed ten to be exceeded in certain instances, but have concluded that it is not sound procedure because it has been in these divisions, invariably, that personnel trouble has developed, and department efficiency has dropped.[2]

Military Studies

Published or unpublished studies of the service school instructor load problem based on sound research are practically non-existent. This does not mean, however, that the services have not studied the problem. On the contrary, every time a new personnel allowance or table of organization for any service school is prepared, considerable thought, and study is given to the overall problem by all levels of command involved. Every time some school submits a request for an increase in the number of instructors allowed, study of the problem is made by the school personnel as well as members

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1. *Loc. cit.*

2. Reginald H. Riggs, "How We Divide Our Work and Why," *On Being a Supervisor*, p. 3.

of any management who must consider the request. Basic thumb rules have been published from time to time and cancelled as they have been proven incorrect or obsolete. Nevertheless, little formalized research has been devoted to the problem. This is well evidenced by the fact that the Research Division of the Bureau of Naval Personnel has included in its list of recommended research topics, the subject:

> Techniques for determining ship's company allowances for a specific service school. (Account for instructional staff in both class and laboratory instruction, administrative and supervisory personnel, welfare and recreation, commissary and service activities, custody and maintenance of instructional equipment and facilities, allowances for personnel on leave and those undergoing training and orientation prior to assignment of full responsibility).[1]

Although such formalized research is lacking, some of the conclusions and recommendations of individuals who have studied the problem through various capacities, are of considerable worth and special interest to this thesis. For example, in an inter-office memorandum in the Bureau of Naval Personnel, the following comments were made on the subject of the instructor-student ratio by an assistant in the Training Section of the Research Division.

> The instructor-student ratio, for adequate instruction, is based on a great number of factors. For example, one instructor can handle 25 trainees in a lecture situation. The same instructor could not handle more than 5 in certain types of operational training. In addition, the size of the

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1. From Enclosure (b) to Superintendent, U.S. Naval Post Graduate School Letter dated Annapolis, Maryland, 5 August 1949.

> school, the rate of input, the length of interval between inputs, the collateral duties assigned instructors, the amount of annual and sick leave taken by instructors, the extra load resulting from changes in length of curricula, and a number of other factors must be taken into consideration before any valid estimate can be made relative to the proper ratio of students to instructors.[1]

Between February and September of 1946, the Bureau of Naval Personnel conducted a study of recruit training for the purpose of determining factors which are of special significance in affecting the quality of instruction in that training and to make recommendations pertaining to the improvement of the program. In the findings of this survey, it was pointed out that certain changes in the curricular content of the course had taken place to the extent that more instructors were needed in some areas of instruction, while fewer personnel were needed in other instructional areas. It was also stated that in order "to attain the basic objectives of recruit training, the ratio of instructors to recruits must be adjusted to provide each Command with the number of training personnel required to teach each area of curriculum in the way it should be taught."[2]

The committee making this study recommended that:

> New quotas for instructional personnel in Recruit Training Commands be developed, based on:

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[1] Homer C. Snow, in a Memorandum to the Director, Standards and Curriculum Division, Bureau of Naval Personnel, 24 April, 1947.

[2] Bureau of Naval Personnel, Research Activity, Training Research Division, "Factors of Special Significance Influencing the Effectiveness of Recruit Training," pp. 6-7. Washington, D.C. November 1946.

(a) The amount of time allotted to instruction in each of the learning activities in the areas of the curriculum and

(b) The desirable ratio of instructors to recruits in each curricular area, considering the activities therein, as well as the methods of instruction which must be employed.[1]

In May of 1947, the Research Division of the Bureau of Naval Personnel initiated a study of the administrative, support, and instructional forces in all formalized service schools of the Navy, exclusive of those in the Naval Air Training Command. The directive[2] to the schools called for organizational charts showing the assignment of personnel for existing student loads, minimum student loads, and various added increments of student load. Recommended student-instructor ratios were included for each phase of each school, together with a recommendation for the average instructor work day. Although the information was submitted as requested, no formal conclusions ever were evolved and the results were negligible. However, a few preliminary conclusions and recommendations were set forth by personnel of the Research Division that were analyzing the data. Some of these conclusions are of interest, even though the exact author is unknown. A few are quoted below to indicate the trend of thought which was developing as a result of the study.

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[1] *Ibid.*, p. 7.

[2] Bureau of Naval Personnel letter File Number P2 Pers 4123-mo dated 16 May 1947.

Recommendations for Instructor-Student Ratio[1]

1. This ratio should be determined not according to rating, but according to type of instruction.

2. Types of instruction to be considered should include:

a. Lecture	1-25
b. Laboratory	1-7
c. Operational	1-5
d. Speed drills	1-20
e. Repair	1-5

3. Extra allowance should be made for:

a. Collateral duties.	
b. Supervision	10 o/o
c. Annual leave	2 o/o
d. Sick leave	4 o/o

4. Instructional work load should be limited to 6 hours per day or less.

5. For each school a minimum should be determined based on a subject matter - class breakdown.

6. Economy in (5) may be effected by staggering classes entering at longer time intervals.

7. Instructor allowances are based on a recommended number of instructional hours a day, viz:

a. 4 hours lecture, 2 hours laboratory, 2 hours of office work.
b. 2 hours lecture, 4 hours laboratory, 2 hours of office work.
c. Office hours to be used in preparing lectures, grading papers, supervisory conferences, and other necessary instructional duties.
d. Laboratory instructor's allowances are based on 4 hours work with students in the laboratory, and 4 hours of preparation of instructional material, maintaining laboratory equipment, building additional equipment, marking papers, supervisory conferences, and other necessary instructional duties.

8. Special consideration must be given to schools having subject matter requiring a minimum of instructors regardless of the number of students. As an

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[1] From two informal memorandums attached to raw material in the files of the Research Division, Bureau of Naval Personnel, submitted in accordance with a directive contained in Bupers letter BO Pers 4115-ms dated 16 May 1947.

Recommendations for Instructor-Student Ratio[1]

1. This ratio should be determined not according to rating, but according to type of instruction.

2. Types of instruction to be considered should include:

a. Lecture	1-20
b. Laboratory	1-5
c. Operational	1-5
d. Speed drills	1-20
e. Repair	1-3

3. Extra allowance should be made for:

a. Collateral duties	
b. Supervision	10 o/o
c. Annual leave	5 o/o
d. Sick leave	4 o/o

4. Instructional work load should be limited to 6 hours per day or less.

5. For each school a minimum should be determined based on a subject matter - class breakdown.

6. Economy in (5) may be effected by staggering classes entering at longer time intervals.

7. Instructor allowances are based on a recommended number of instructional hours a day, viz:

a. 4 hours lecture, 2 hours laboratory, 2 hours of office work.
b. 2 hours lecture, 4 hours laboratory, 2 hours of office work.
c. Office hours to be used in preparing lectures, grading papers, supervisory conferences, and other necessary instructional duties.
d. Laboratory instructor's allowances are based on 6 hours work with students in the laboratory, and 2 hours of preparation of instructional material, maintaining laboratory equipment, building additional equipment, marking papers, supervisory conferences, and other necessary instructional duties.

8. Special consideration must be given to schools having subject matter requiring a minimum of instructors regardless of the number of students. As an

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[1] From the informal memorandum attached to the material in the files of the Research Division, Bureau of Naval Personnel, submitted in accordance with a directive contained in BuPers letter NC Pers 4115-mo dated 16 May 1947.

example, in a XX school, 8 classes are being taught daily. That will require a minimum of 8 instructors, working 8 hours a day regardless of whether 5 or 50 students are in the school.

The Dawson-Wiley Study

In the spring of 1943, the Navy started a large expansion of service schools, particularly in the aviation branch of the service. The expansion was planned in equal increments spread over a six months period, but because of the fact that the increased student load would progress from one class of school to another, it became evident that the expanded load would be in the school system for more than a year. It was realized by planning personnel that this expansion would cause extreme variations in the input quotas, frequencies of input, and general nature of the student body in the schools. A workable tool for computing instructor requirements which would allow for the major variables was needed. Accordingly, Dawson and Wiley[1] studied their instructor utilization charts for past performance, set certain arbitrary standards for instructor work load, and devised a technique for giving a good estimate of instructors needed in any service school, whatever the changes in input quota, frequency of input, or curriculum content. This technique was used unofficially by the Naval Air Technical Training Command for some time in computing instructor allowances and in general computing of manpower requirements. Modifications and improvements to the technique were developed and it has been promulgated as the official procedure for computing instructor requirements for schools in that Command.

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[1] LCDR Graham H. Dawson, U.S.N.R. and LCDR C.S. Wiley, U.S.N., Naval Air Technical Training Command.

This technique is built around certain fundamental concepts and standards. Excerpts from the document[1] which established it as an official procedure are quoted below:

> When a new school is established, it becomes necessary to determine the total number of instructors required for the efficient conduct of instruction. The same problem is presented when the length of a course, frequency of input, or an established quota is changed within this total requirement. Allowances must be made for necessary supervision, instructor replacement, annual leave, and normal losses due to contingent unavailability.
>
> The total number of instructors required in any school must be considered from an efficient instruction standpoint, and, at the same time, must not be in excess of actual needs necessary to maintain consistently high standards of training.
>
> The factors to be considered in the compilation of instructor requirements are as follows:
>
> a. All student-instructor ratio computations are to be based on a six hour instructional day per instructor . . . Further, it has been demonstrated that the average instructor requires a minimum of two hours per day to prepare himself professionally and technically for the duty of instruction and to complete school administrative work directly connected with the training program.
>
> b. For formal class work, the student-instructor ratio is to be no more than 25/30:1. The use of higher ratios than this is accompanied by a loss of efficiency in training, inasmuch as only those trainees who are above the average will be able to assimilate the instruction. In schools where the input is less than 25 per period, the student-instructor ratio will of necessity be correspondingly lower.
>
> c. The student-instructor ratio for shop, laboratory, or field training will closely approximate 6:1, which is in accordance with the dictates of experience with the peculiarities of this type of training.
>
> d. A number of supervisors must be provided to conduct and properly oversee an efficient program

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[1] Chief of Naval Air Technical Training Instruction Number 7-22-30, Dated Memphis, Tennessee, 27 February 1950.

of instruction. This requirement is 10 o/o of the number of basic instructors to provide proper supervision with no greater than a 10 to 1 ratio.

e. Provision must be made for additional instructors above this basic requirement to replace the contingent unavailables (sickness, emergency leave, TAD, etc.), those on annual leave and those undergoing professional training prior to assignment. The following percentage factors of the total instructor requirement must be added for these categories:

Contingent Unavailables	3.0 o/o
Annual Leave	8.2 o/o
Professional Training	7.0 o/o

The only weakness in this system lies in the fact that the concepts and standards have not been based on true research. They are the best estimates of personnel familiar with the problem in the Memphis area, or in the Bureau of Naval Personnel, but they have not been proven or validated by any recognized research technique. However, this system, (known in the Naval Air Technical Training Command as the Benson-Riley technique), has produced excellent results in that Command, and is the central idea around which this thesis is based. The exact details of the method, together with a discussion of the standards used, will be presented in Chapter VI.

CHAPTER IV

OBTAINING THE INFORMATION REQUIRED

General

In order to accomplish the objectives of this study, information was required to:

1. Show the nature of the problem, and adequately illustrate the variables.
2. Furnish a basis for the derivation of certain standards which can be used as reference points in any yardstick used for measuring instructor requirements.

To obtain this information it was necessary first to study the existing situation in service schools. Experience gained from personnel planning work in the Naval Air Technical Training Command was used. Visits to three large service school bases of the U.S. Air Force supplied information. A review of the evaluation of certain Army service schools proved helpful.

To furnish material for the derivation of certain standards, it was necessary to review previous studies on the subject of teacher load and service school instructor problems. This information has been presented in Chapter III.

The Questionnaires

In order to illustrate graphically the elements of the problem and also to provide concrete data for the establishment of the standards, it was necessary to devise a

questionnaire which would give information relative to the existing situation in service schools, and which also would furnish recommendations and opinions relative to the condition that should exist in these schools.

Accordingly, three questionnaires were constructed. All were of the same basic nature, except that they were designed to fit the backgrounds of three different staff levels in the service school, namely the instructor, the supervisor, and the administrator.[1] In the process of devising the final questionnaires, a pre-test was made on personnel in the U.S. Navy Electronics School, Treasure Island, San Francisco, California. Forty-five instructors, two supervisors, and twenty administrators were surveyed. Their suggestions and the results of this test run, provided valuable material for the construction and administration of the final questionnaires.

In selecting a group of service schools in which to administer the final questionnaires, the Naval Air Technical Training Center in Memphis, Tennessee was chosen for several reasons. In the first place, it is a large base, and supports the majority of the aviation technical schools in the Navy. As of 1 February 1950, there were eighteen different schools and one mobile training detachment aboard the station. The administrative, support, and maintenance forces for these schools numbered 917 and the combined supervisor and instructor strength was 1140. These figures include commissioned officers, enlisted personnel, and civilians.

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1. Copies of the questionnaires are in the Appendix.

A second reason for choosing this base for experimentation results from the fact that it is the headquarters for the Staff of the Chief of Naval Air Technical Training. Personnel on that Staff have done much work in the instructor problem area and are most anxious to develop a sound and workable yardstick for measuring the needs of their schools. The opinions, recommendations, and conclusions which they have developed, have been of unlimited value in this thesis.

For the administration of the questionnaires, a large wing of one mess hall was set up with tables and benches. Adequate lighting, heat, and ventilation were provided. An order was issued several days ahead of time, directing all instructors, administrators, and supervisors to report to the designated building on either of two assigned days for the purpose of filling out the questionnaire. This order specifically stated that personnel would comply at their own convenience.

On the first assigned day, a muster roll of the instructors and supervisors was provided by the Personnel Accounting Machine Installation. As personnel reported for the questionnaire, they first were scratched off the muster roll, then questioned as to their status (instructor, supervisor, or administrator), and handed the proper questionnaire. They were told at this time that if they had any question concerning the study or the questions, they should not hesitate to consult the head administrator. At no time were there more than one hundred personnel occupied with the questionnaires

simultaneously. The average length of time to complete the instructor questionnaire was about thirty-five minutes. As the questionnaires were completed, each individual placed his own on a table provided for that purpose. At no time was any attempt made to identify any questionnaire with the individual concerned. Normal working hours, including the lunch period, were the only periods during which the questionnaires were administered.

No special instructions were given, other than those contained on the first page of each questionnaire. However, the head administrator reminded those in the room that complete anonymity would be maintained, that opinions of the individual and not his neighbors were desired, and that no one should hesitate to ask questions. This reminder was given once every fifteen minutes during the course of the administration period. The author acted as head administrator and was assisted by two first class petty officers.

It is considered that the procedure used in the administration of this program was completely satisfactory and insured conscientious and interested attention on the part of all personnel concerned. Harrell has pointed out that a similar system has been proven successful in the past. He states:

> A method of studying attitudes that proved successful and useful with soldiers during World War II was to assemble a group of people to be questioned in a room and have them fill out a questionnaire. The questionnaire would be explained by a member of the group being questioned who had been individually instructed. The respondent here, as in attitude-testing procedures in general, is not asked for his name and is assured that his

> attitudes are to be kept confidential with respect to his identity.[1]

One of the most gratifying observations of this study was the intense interest and serious attitude displayed by personnel completing the questionnaires. Relatively few questions were asked concerning the meaning of items within each questionnaire but much constructive criticism and many suggestions were volunteered, either in the comment sections or to the head administrator personally. It is not unusual for enlisted personnel to appreciate keenly any interest which is given to their work, and this program was no exception to the rule.

A total of 522 instructor questionnaires, 126 supervisor questionnaires, and 110 administrator questionnaires were completed in the two day period assigned. The distribution among the various types of schools is shown in Figure 71. Although this does not represent 100 percent coverage of personnel assigned to the Training Center, it is almost complete in view of the fact that approximately 3 percent of the personnel were on leave, over 125 instructors and supervisors were in the field teaching with mobile training units, and others were absent because of sickness or disciplinary action. Also, many personnel had reported just recently for duty in an instructor capacity and were not required to complete questionnaires in view of their inexperience. There were undoubtedly some who did not report for the program because of heavy work loads, lack of interest, or forgetfulness.

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[1] Thomas Willard Harrell, Industrial Psychology, p. 300.

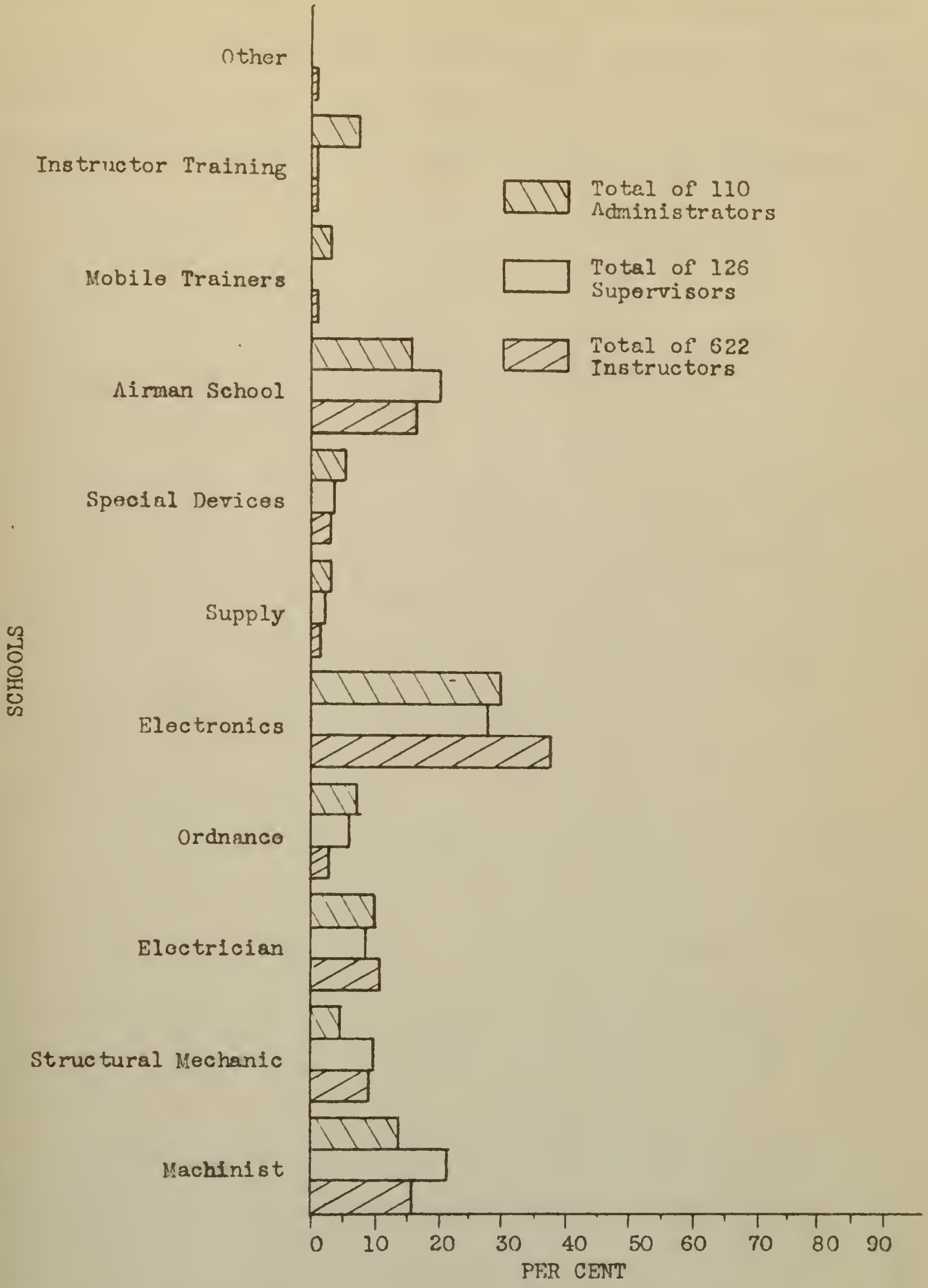

FIGURE 71. DISTRIBUTION OF QUESTIONNAIRES AMONG VARIOUS TYPES OF SCHOOLS

All questionnaires were serialized after administration of the program, then coded, and data transcribed on IBM cards. All tabulation was done by International Business Machines, after which the information was analyzed, the results of which are described in Chapters II and V.

CHAPTER V

ANALYSIS OF THE INFORMATION OBTAINED

General

As pointed out in the beginning of Chapter IV, information was obtained to show the nature of the problem and to graphically illustrate the variables involved. The majority of the information obtained from the questionnaires was devoted to this purpose and has been analyzed, discussed, and illustrated in the analysis of the problem in Chapter II. The remainder of the information obtained was related to those elements of the problem which could be considered from an objective point of view. The following pages contain the analysis of this information.

Indoctrination Period

The amount of time required to prepare a new candidate for instructor duty, exclusive of formalized training, was measured. This has been illustrated in Figure 24 (p. 41). The mean time for this indoctrination in the Memphis schools as reported by the instructors, is 2.0 to 2.5 weeks per instructor.

Figure 73 illustrates the opinions of administrators, supervisors, and instructors relative to the amount of time which they feel should be devoted to this phase of the problem. The mean time recommended by the instructors is 3.9

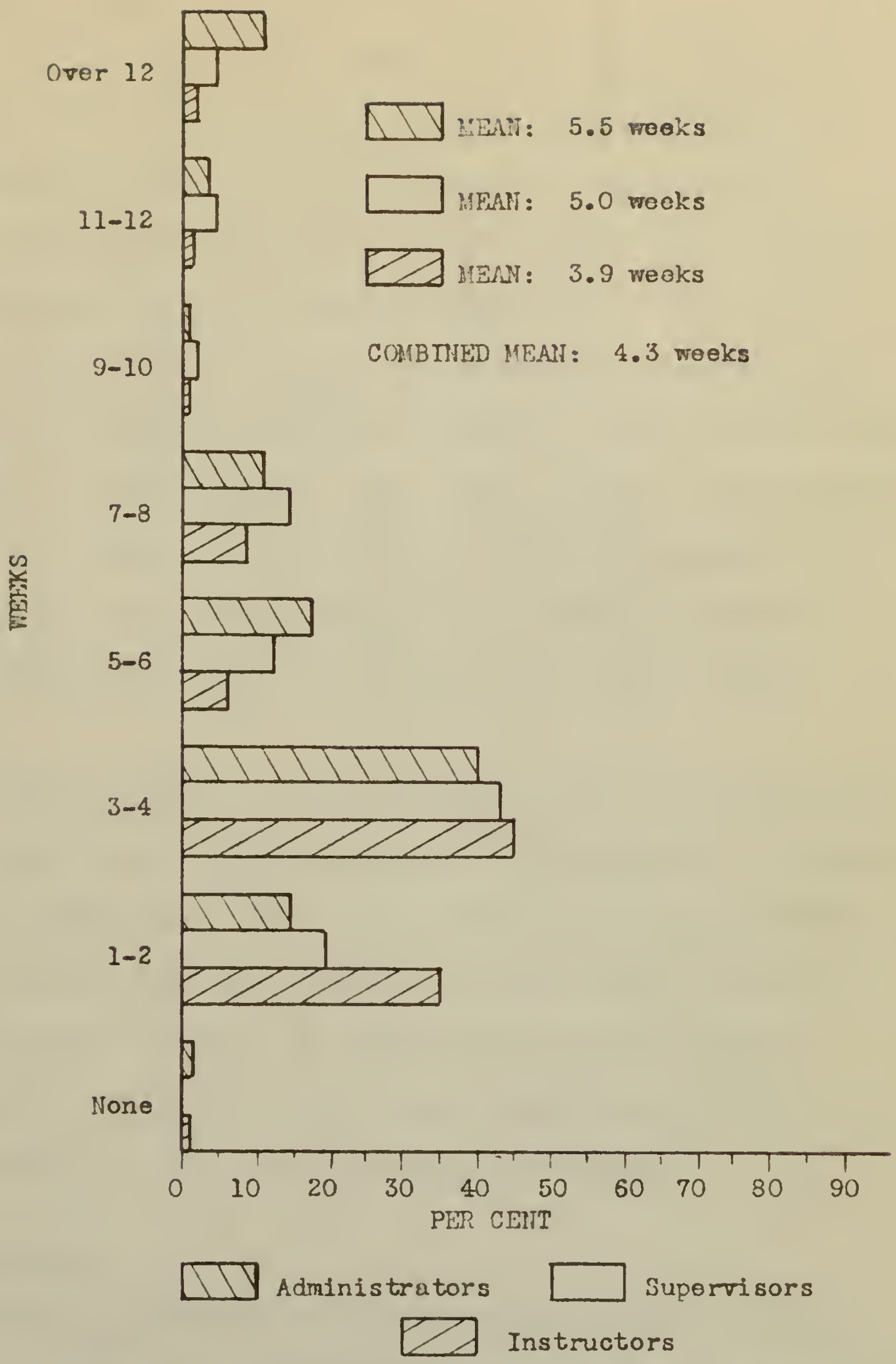

FIGURE 72. OPINIONS OF ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS RELATIVE TO THE NUMBER OF WEEKS THAT SHOULD BE DEVOTED TO THE INDOCTRINATION OF INSTRUCTOR CANDIDATES (EXCLUSIVE OF FORMALIZED TEACHER TRAINING)

weeks, while the supervisors recommended a mean time of 5.0 weeks, and the administrators recommended 5.3 weeks. The mean time recommended by all three groups combined is 4.3 weeks. This would indicate that Memphis instructors are not receiving the amount of indoctrination they feel is necessary, nor is it the amount of time which their supervisors and administrators feel is required.

If the four weeks required for formalized training in the Instructor Training Schools is added to this indoctrination period, it would appear that under average circumstances, a total of 8.3 weeks are required for indoctrination, formalized training, and phase instruction of the instructor before he can be classified as fully qualified, and put on his own.

This figure should not be compared with the 7.8 percent additional personnel which Benson and Wiley require in their system for professional training.[1] Their percentage figure includes time required for transit between duty stations and leave granted enroute, in addition to professional training time. It is based also on a thirty-six month tour of instructor duty for personnel concerned.[2]

Instructional Day

Figure 73 illustrates the maximum and minimum hours a day which instructors in Memphis schools devote to the actual

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1. *Supra*, p. 104.

2. Statement by LCDR G.C. Wiley, U.S.N. in personal letters dated 6 March 1956 and 30 March 1956.

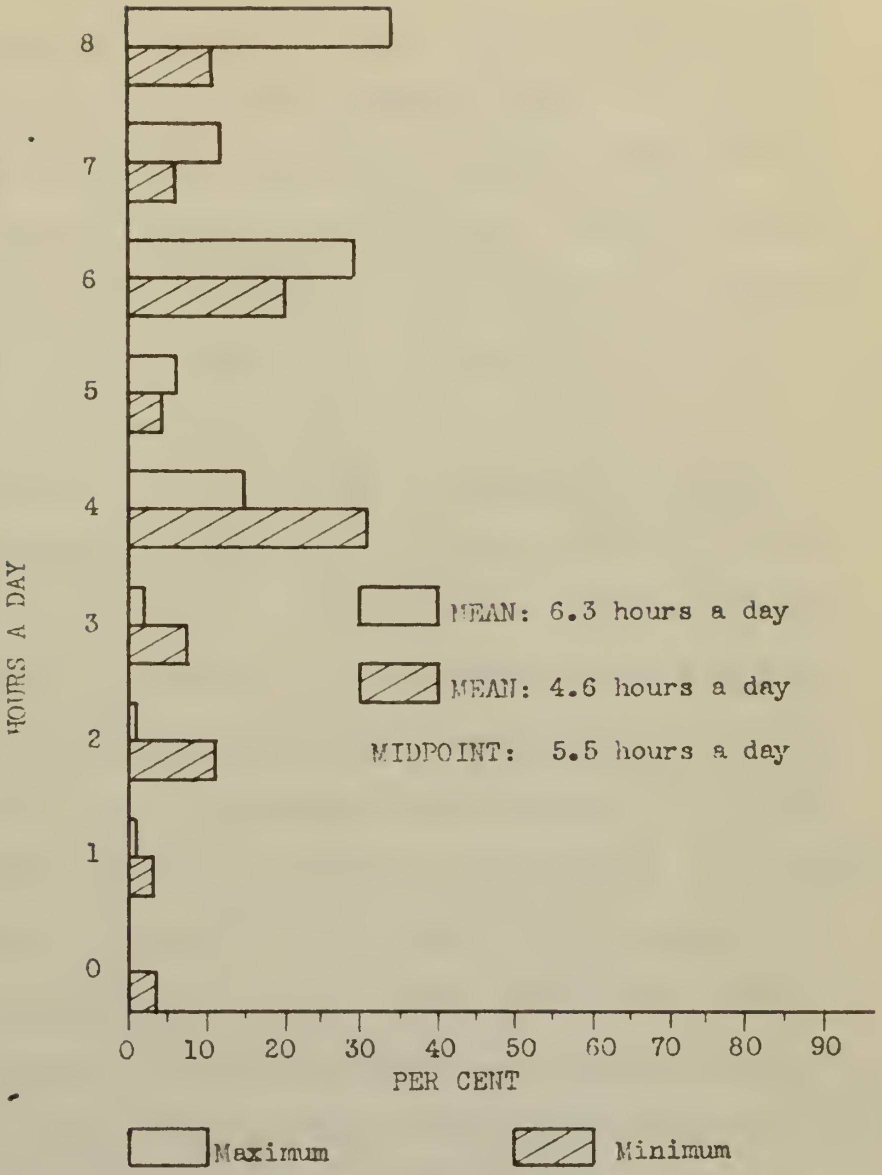

FIGURE 73. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING MAXIMUM AND MINIMUM HOURS A DAY DEVOTED TO THE ACTUAL TEACHING OF STUDENTS (EXCLUSIVE OF NIGHT CLASSES)

teaching of students. The mean of the maximum figures is 6.3 hours per day and for the minimum figures, 4.6 hours per day. The midpoint between the maximum and minimum figures is 5.5 hours per day.

The opinions of administrators, supervisors, and instructors relative to what the maximum length of the instructional day should be, are illustrated in Figure 74. The means of the opinions are as follows: administrators, 5.1 hours a day; supervisors, 4.8 hours a day; and instructors, 5.1 hours a day. The mean opinion for all three groups combined is 5.1 hours per day.

These opinions seem to correlate rather well with Douglass' observations mentioned earlier, wherein he set forth the five class day as the maximum if proficient instruction were to be gained.[1] It is somewhat lower than the six hour maximum day tentatively estimated by the Research Division of the Bureau of Naval Personnel in their survey of service schools,[2] and also established as a standard by Benson and Wiley in their system of computation.[3] It would seem, however, in view of the fact that studies in civilian schools have been based on extensive research, and since the figure of 5.1 hours a day is the consensus of opinion of a rather large sample of qualified personnel

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[1] *Supra*, pp. 90-1.

[2] *Supra*, p. 101.

[3] *Supra*, p. 103.

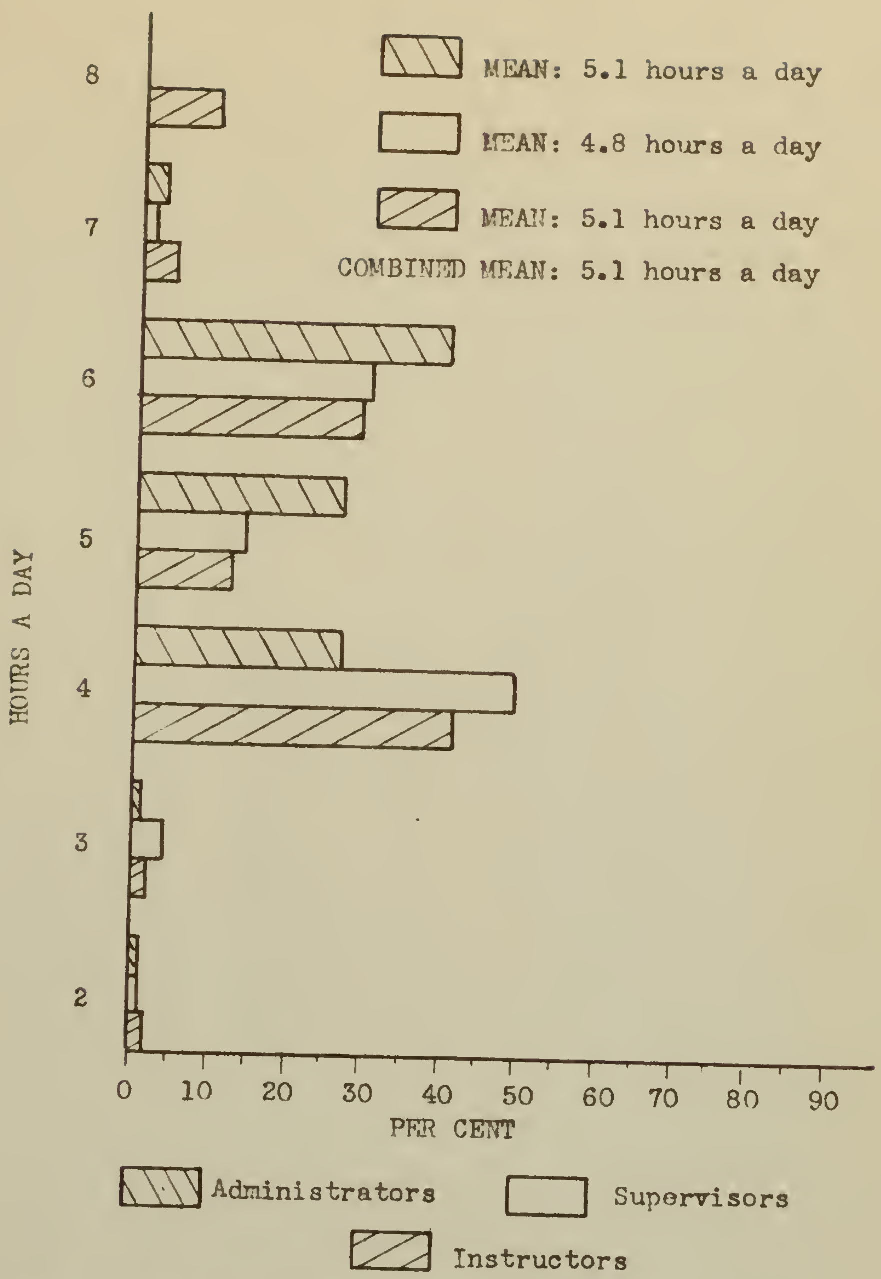

FIGURE 74. OPINIONS OF ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS RELATIVE TO THE MAXIMUM LENGTH OF THE INSTRUCTIONAL DAY

directly associated with the problem, the five hour instructional day is the best standard for the average situation.

Instructional Week

It would seem natural to presume that since the services schools operate on a five day instructional week, and since the mean opinion of Memphis personnel centered on a five hour instructional day, the mean opinion for an instructional week would be twenty-five hours. This did not prove to be the case, however.

As shown in Figure 75, not all instructors spend five days a week in front of their classes. Variations will depend principally on the ability of the instructor and the assignment of non-instructional duties. The mean number of days that Memphis instructors spend in front of their classes is 4.7 per instructor. The average number of hours a week which these instructors spend instructing is shown in Figure 76. The mean of these figures is 24.8 hours a week.

Figure 77 shows the opinions of administrators, supervisors, and instructors relative to what the length of the instructional week should be. The means of these opinions are: administrators, 22.7; supervisors, 20.3; and instructors, 21.9 hours a week. The mean of the recommendations of the three groups combined is 23.2 hours a week.

This figure is somewhat higher than the standard recommended by the National Commission on Teacher Education and Professional Standards, which called for a total school week not to exceed forty hours, of which fifteen to twenty hours would be devoted to instruction.[1] However, it is considerably

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[1] Supra, p. 92.

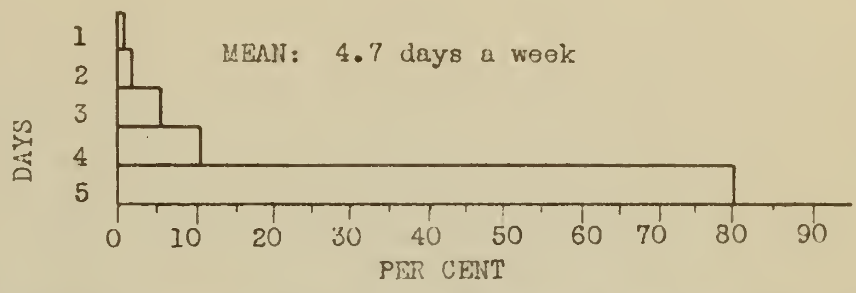

FIGURE 75. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF DAYS A WEEK THAT EACH INSTRUCTOR HAS CLASSES FOR INSTRUCTION

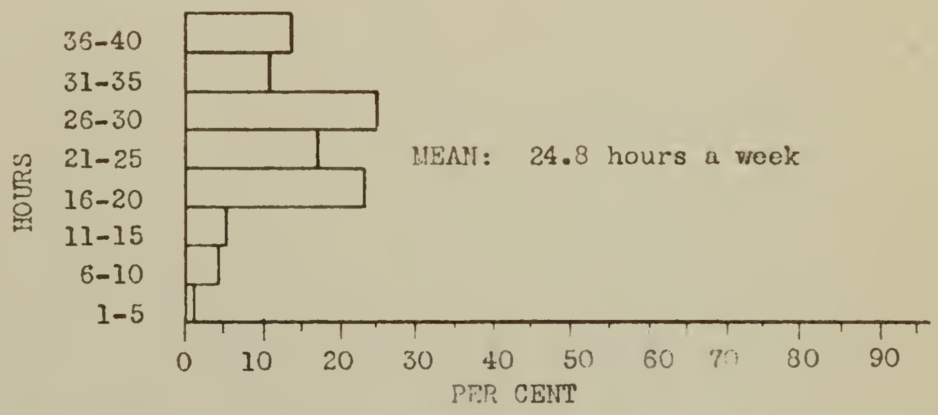

FIGURE 76. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING THE AVERAGE NUMBER OF HOURS A WEEK DEVOTED TO TEACHING STUDENTS

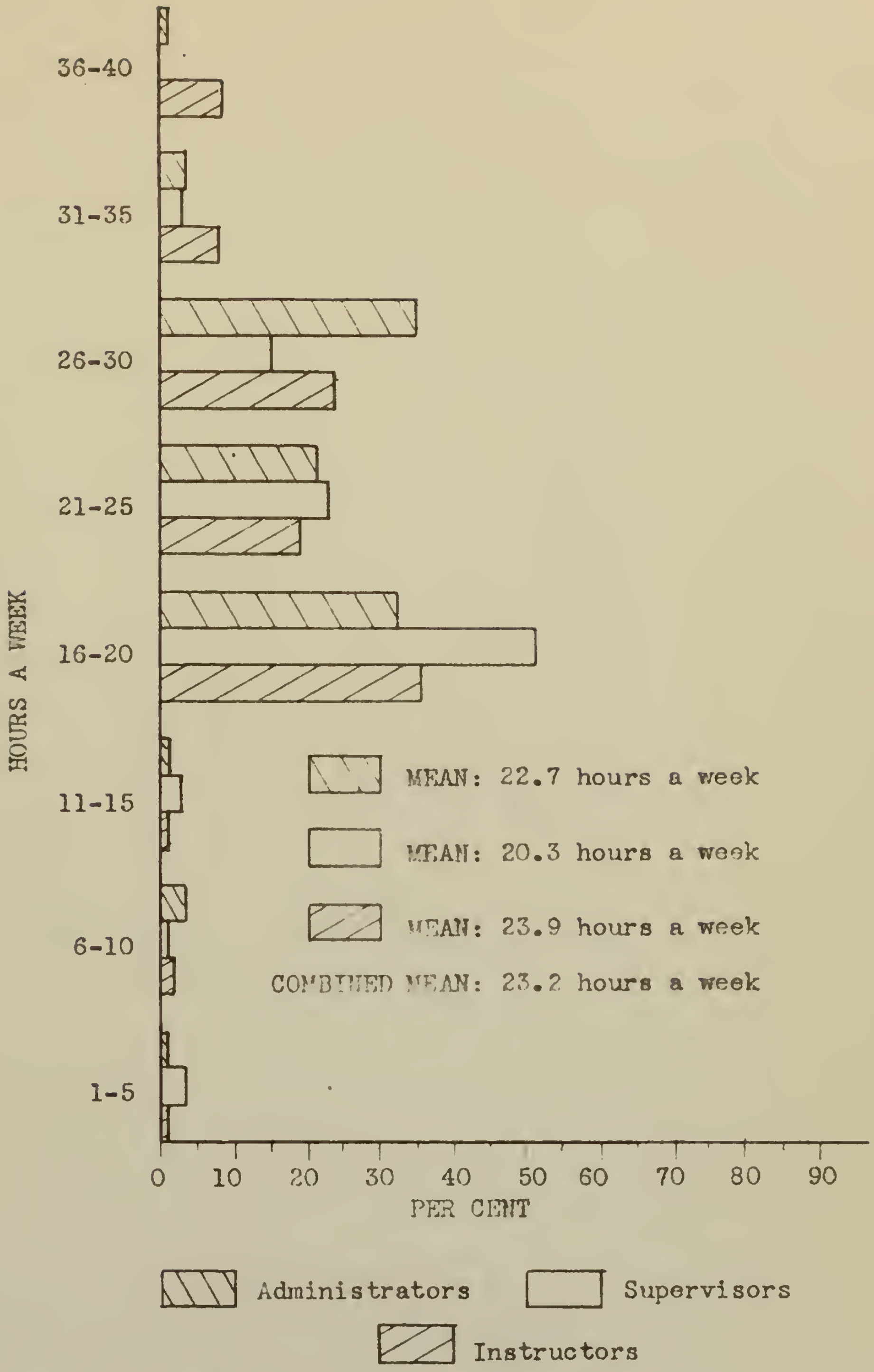

FIGURE 77. OPINIONS OF ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS RELATIVE TO THE MAXIMUM LENGTH OF THE INSTRUCTIONAL WEEK

lower than the thirty hour week set forth by Benson and Wiley[1] and the preliminary estimates of the Research Division of The Bureau of Naval Personnel.[2]

Additional opinions on this subject are illustrated in Figures 78, 79, and 80 which show the attitudes of Memphis personnel relative to a proposed work week composed of thirty hours instruction and ten hours under instruction preparing for other phases or units. The question used was devised in such a manner that a preponderance of answers should have expressed objection, since no time was allowed in the work week for preparation of material. It was felt that such a question would bring forth more constructive comments than one which set forth a more logical work week. In view of the fact that almost 30 percent of the personnel objected to the proposition because of some element involving fatigue or boredom and since only 10.5 percent agreed that the week was satisfactory as set-up, it appears that the thirty hour instructional week is unsatisfactory.

A compromise must be made then between the thirty hour week used by Benson and Wiley, the fifteen to twenty hour week recommended by the National Commission on Teacher Education and Professional Standards, and the mean instructional week of 23.2 hours recommended by the personnel at Memphis. It appears that a twenty-five hour instructional week would be in order, providing that at least five of these hours were

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1. *Supra*, p. 103.
2. *Supra*, p. 101.

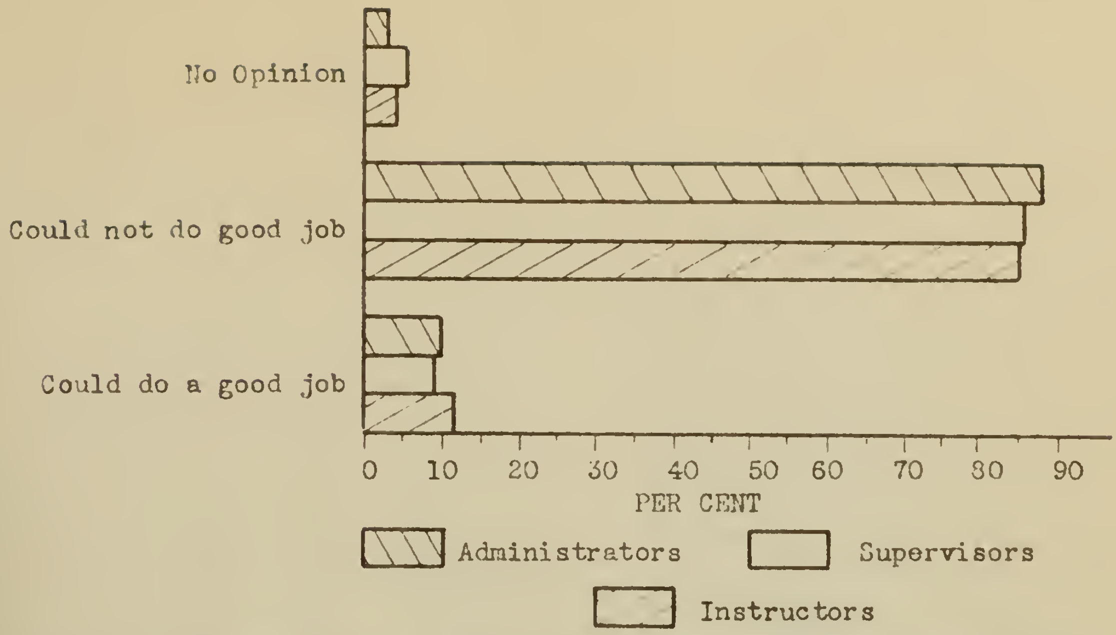

FIGURE 78. RESPONSE OF ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS TO QUESTION ASKING IF AN INSTRUCTOR COULD TEACH FOR 30 HOURS AND ATTEND PHASE OR UNIT INSTRUCTION FOR ANOTHER 10 HOURS DURING THE SAME WEEK AND STILL DO A GOOD JOB OF INSTRUCTING

CATEGORY #	REASON
1.	There would be no time for preparation of material, maintenance of equipment, construction of training aids, or general creative work.
2.	Such a work week would leave an instructor so fatigued that he would be unable to absorb any material or do a decent job of instructing.
3.	There would be no time for preparation of material and the instructor would become too fatigued.
4.	At least ten hours a week are needed for preparation of material.
5.	A work week of forty hours, composed of twenty hours teaching duty, ten hours under instruction, and ten hours available for preparation would be ideal.
6.	That much work would result in complete boredom of the instructor.
7.	The proposed work week would be satisfactory if all of the teaching duty was in the laboratory.
8.	Miscellaneous reasons other than those given above.
9.	No reasons given at all.

FIGURE 79. CATEGORIES OF REASONS GIVEN BY ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS FOR ANSWERS GIVEN TO QUESTION CONCERNING A PROPOSED WORK WEEK OF THIRTY HOURS TEACHING DUTY AND TEN HOURS UNDER INSTRUCTION (SEE FIGURE 78)

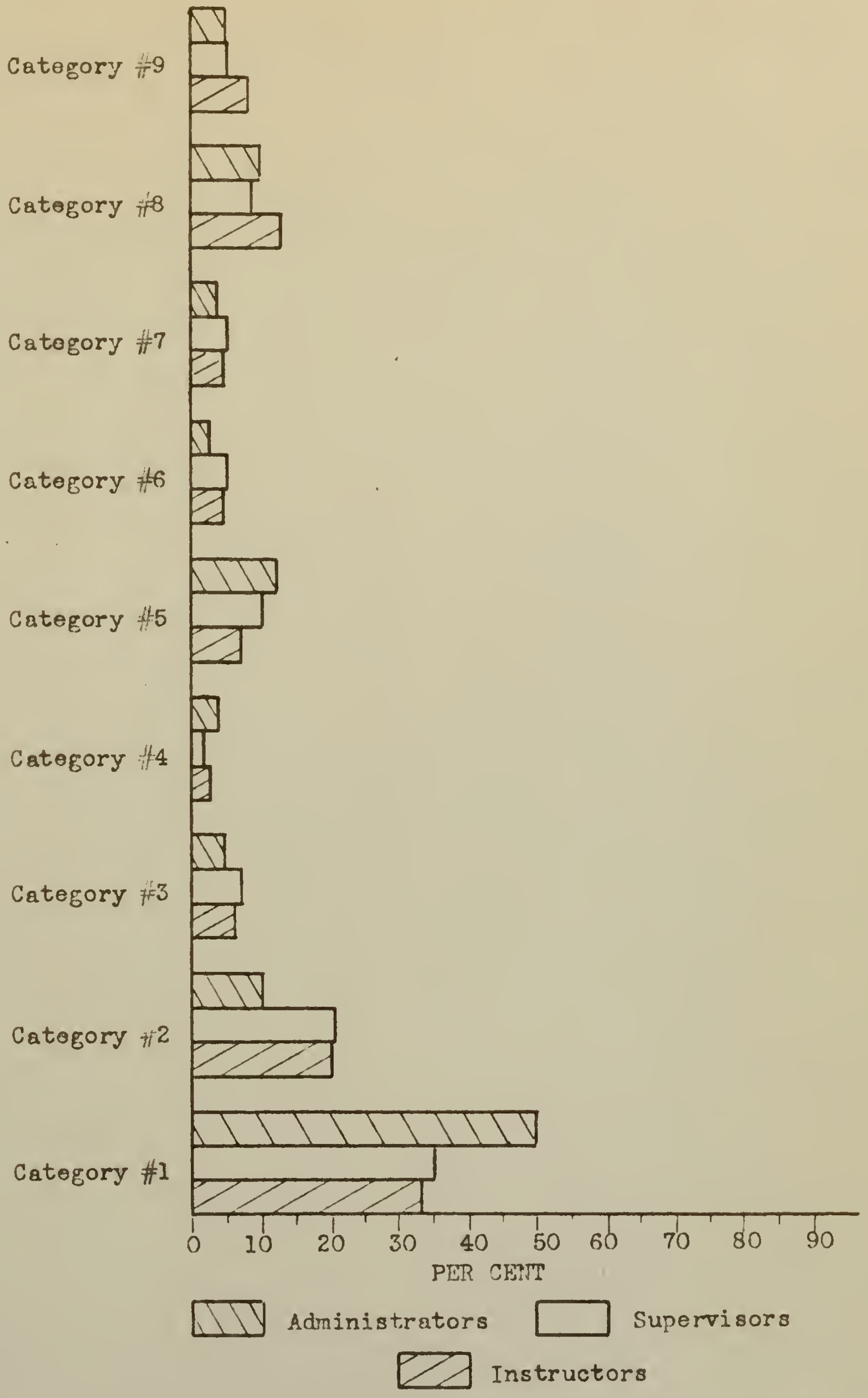

FIGURE 80. RESPONSE MADE BY ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS IN GIVING REASONS FOR ANSWERS TO QUESTION CONCERNING A PROPOSED WORK WEEK OF THIRTY HOURS TEACHING DUTY AND TEN HOURS UNDER INSTRUCTION. (SEE FIGURES 78 AND 79)

devoted to laboratory, shop, line, field, or flight instruction.

Class Size

Classroom Lecture Instruction

Figure 61 shows the maximum and minimum number of students in classrooms of the Memphis service schools. If all class sizes in the "over 50" category are included in the "51-55" interval, the maximum mean class size is 28.4 students per class and the minimum mean size is 15.7 students per class. The midpoint between the maximum and minimum is 22.1 students per class.

The opinions of administrators, supervisors, and instructors relative to maximum class size are illustrated in Figure 62. The means of the opinions are as follows: administrators, 19.7 students per class; supervisors, 16.6 students per class; and instructors, 18.6 students per class. The mean of the combined opinions of these three groups is 18.4 students per class.

This latter figure is below the twenty to twenty-five student class which Douglass considered average.[1] It is also less than the norm of twenty-five to one recommended by the North Central Association of Secondary Schools and Colleges,[2] the thirty student class recommended by forty-three California administrators,[3] or the 25/30 to one standard established

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1. *Supra*, p. 91.
2. *Supra*, p. 92.
3. *Supra*, p. 95.

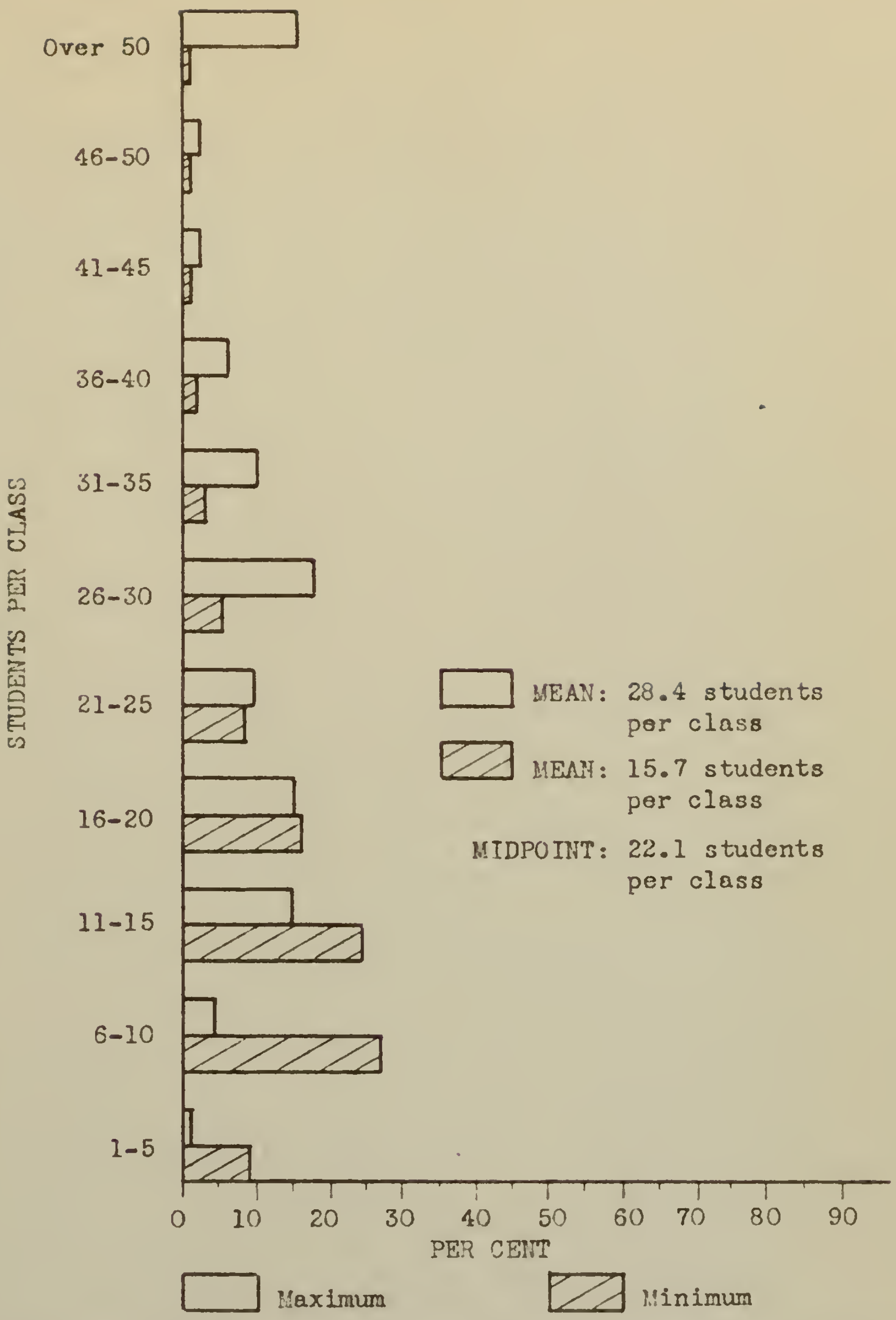

FIGURE 81. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING EXISTING MAXIMUM AND MINIMUM CLASS SIZE IN CLASSROOM LECTURE INSTRUCTION

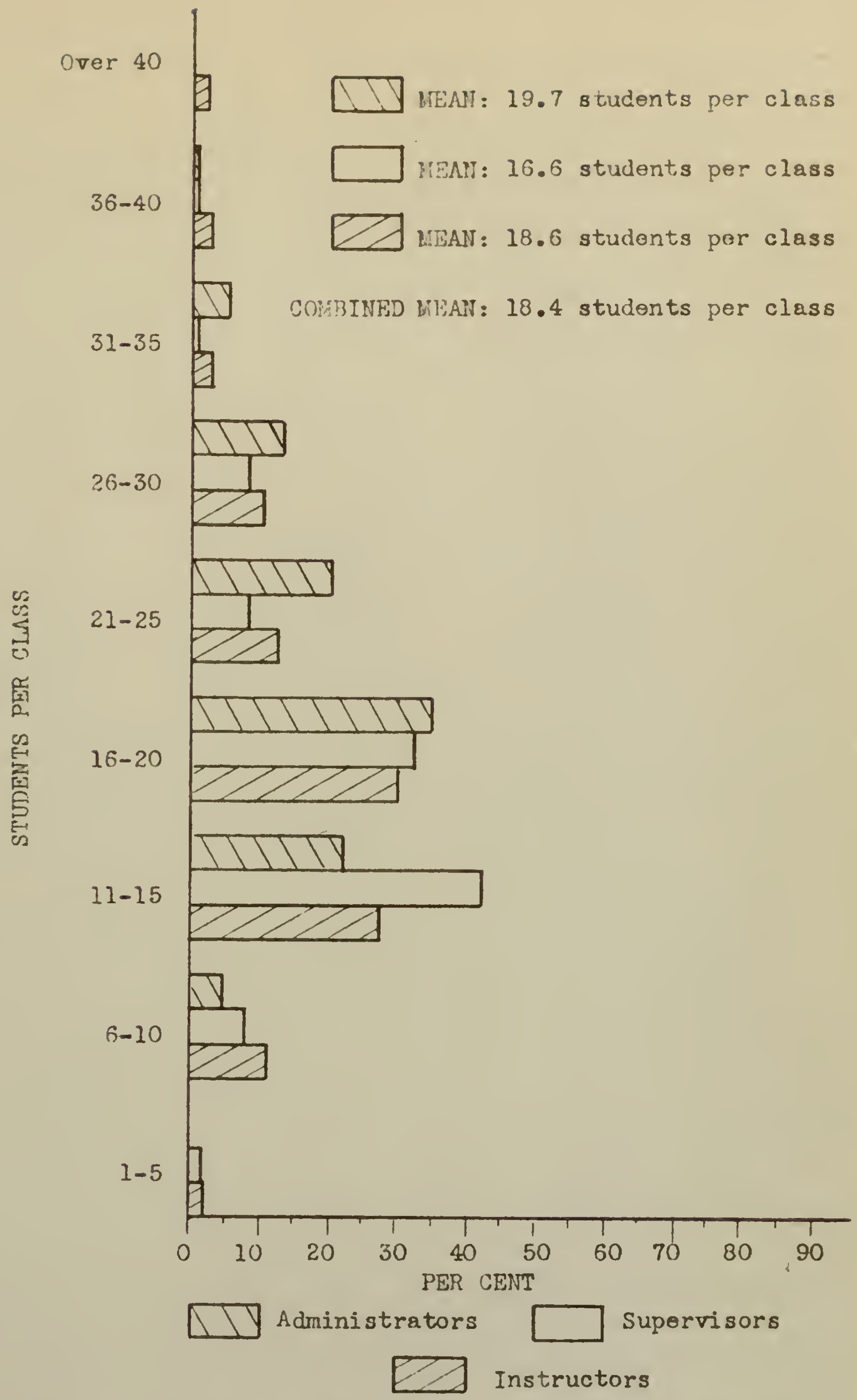

FIGURE 82. OPINIONS OF ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS RELATIVE TO THE MAXIMUM CLASS SIZE FOR CLASSROOM LECTURE INSTRUCTION

by Benson and Riley.[1] It is quite close however, to the preliminary estimate of twenty to one made by the Research Division of the Bureau of Naval Personnel,[2] and to the median of mean class sizes in industrial arts classes in California, which is twenty pupils per class.[3] It is quite probable that because of the technical nature of the material which is presented in service schools and also because of the lack of professional teaching experience on the part of the instructors, a class of more than twenty students presents an excess burden in giving individual attention to the student, and cannot be considered acceptable in the average situation. It would seem then, that a class size between eighteen and twenty students should not be exceeded under average conditions.

Laboratory, Shop, Line, Field, or Flight Instruction

Figure 83 shows the existing situation in the Memphis schools relative to the maximum and minimum number of students in classes where laboratory, shop, line, field, or flight instruction is given. If all class sizes in the "over 50" category are included in the "51-55" interval, the mean for the maximum class size is 19.5 students per class and for the minimum, 11.9 students per class. The midpoint between these figures is 15.7 students per class.

The opinions of administrators, supervisors, and instructors concerning the maximum size of classes for this

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1. Supra, p. 103.
2. Supra, p. 101.
3. Supra, p. 95.

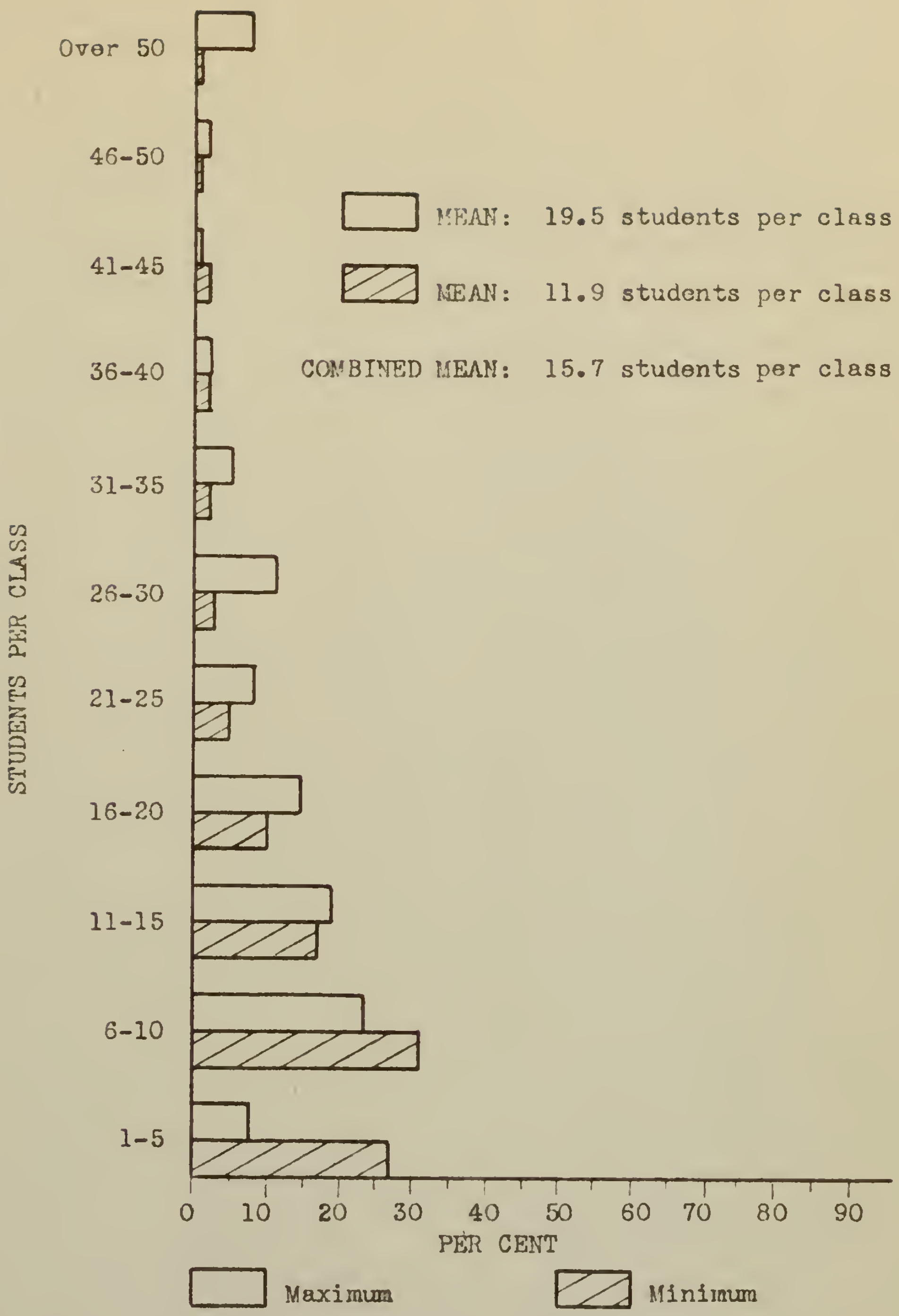

FIGURE 83. INSTRUCTORS' RESPONSE TO QUESTION CONCERNING EXISTING MAXIMUM AND MINIMUM CLASS SIZE IN LABORATORY, SHOP, LINE, FIELD, OR FLIGHT INSTRUCTION

type of instruction are illustrated in Figure 84. The means of the opinions are as follows: Administrators, 7.7 students per class; supervisors, 7.6 students per class; and instructors, 10.4 students per class. The mean of the combined opinions was 9.7 students per class.

These figures are considerably higher than the six to one ratio used by Denton and Wiley[1] and they are much higher than the preliminary estimates made by the Research Division of the Bureau of Naval Personnel.[2] It was thought at first that possibly personnel from one type of school were forcing up the average because of the peculiar nature of their subject material. Accordingly, a breakdown of the same data for the Machinist Schools and the Electronics Schools was run separately, as illustrated in Figure 85. The mean of opinions for the instructors in both types of schools is 9.1 students per class.

It therefore appears that the smaller ratios of five or six to one which have been commonly accepted, are open to question, and that a more realistic standard of class size for this type of instruction, under average conditions, would be nine or ten students per class.

Supervision

The size of the supervisory force in the Memphis schools in relation to the number of instructors assigned is

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[1] Supra, p. 103.

[2] Supra, p. 101.

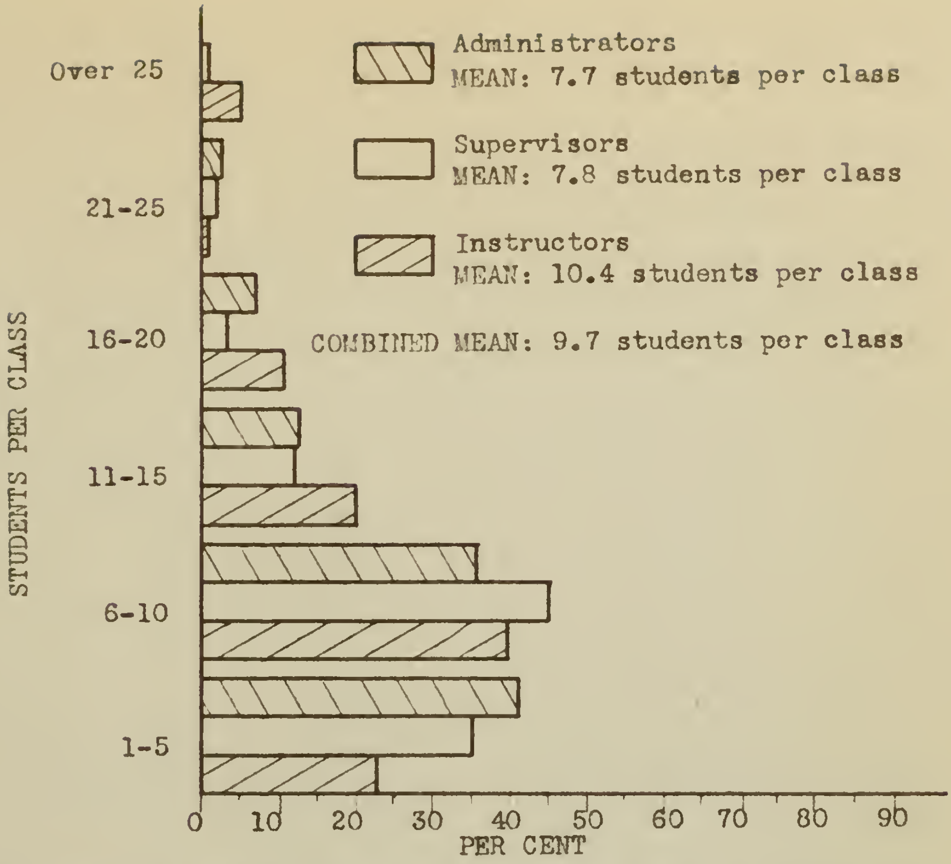

FIGURE 84. OPINIONS OF ADMINISTRATORS, SUPERVISORS, AND INSTRUCTORS RELATIVE TO THE MAXIMUM CLASS SIZE FOR LABORATORY, LINE, SHOP, FIELD, OR FLIGHT INSTRUCTION

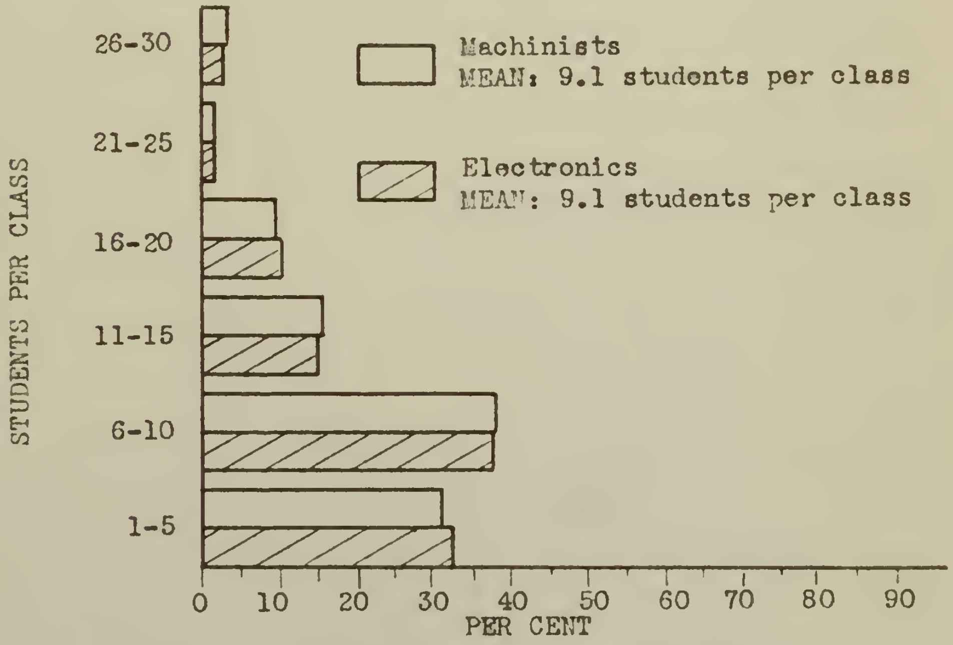

FIGURE 85. COMPARISON OF OPINIONS OF ELECTRONICS AND MACHINIST INSTRUCTORS RELATIVE TO MAXIMUM CLASS SIZE FOR LABORATORY, LINE, SHOP, FIELD, OR FLIGHT INSTRUCTION

illustrated in Figure 26. The mean of the existing instructor/supervisor ratio is 9.7 to one.

The opinions of administrators and supervisors concerning the ratios of supervisors to instructors that should exist, is shown in Figure 27. The mean of the administrators' recommendations is 7.3 to 7.7 instructors per supervisor and that of the supervisors is 8.9 to 9.1 instructors per supervisor. The mean of the combined opinions is 8.2 to 8.4 instructors per supervisor.

There is no explanation as to why the administrators feel that the supervisory load should be reduced, or why there is disagreement between them and the supervisors. This is especially perplexing when it is considered that a large number of the supervisors act as instructors for several hours during the week in addition to their supervisory duties. Both recommendations, however, correlate closely with Biggs' statement that the number of personnel a supervisor can supervise efficiently is between seven and ten.[1] The recommendations of the supervisors are also close to the standards set by Peterson and Plummer,[2] as well as those established by Benson and Wiley[3] and the preliminary estimates by the Research Division of the Bureau of Naval Personnel.[4]

In view of these facts, it then seems logical that the standard for supervision in service schools should be set

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[1] *Supra*, p. 97.

[2] *Supra*, p. 96.

[3] *Supra*, p. 103.

[4] *Supra*, p. 101.

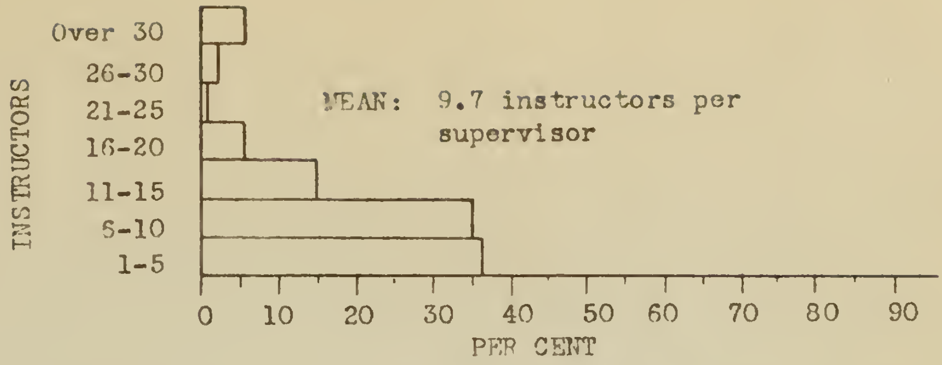

FIGURE 86. SUPERVISORS' RESPONSE TO QUESTION CONCERNING THE EXISTING NUMBER OF INSTRUCTORS ASSIGNED TO EACH INDIVIDUAL SUPERVISOR

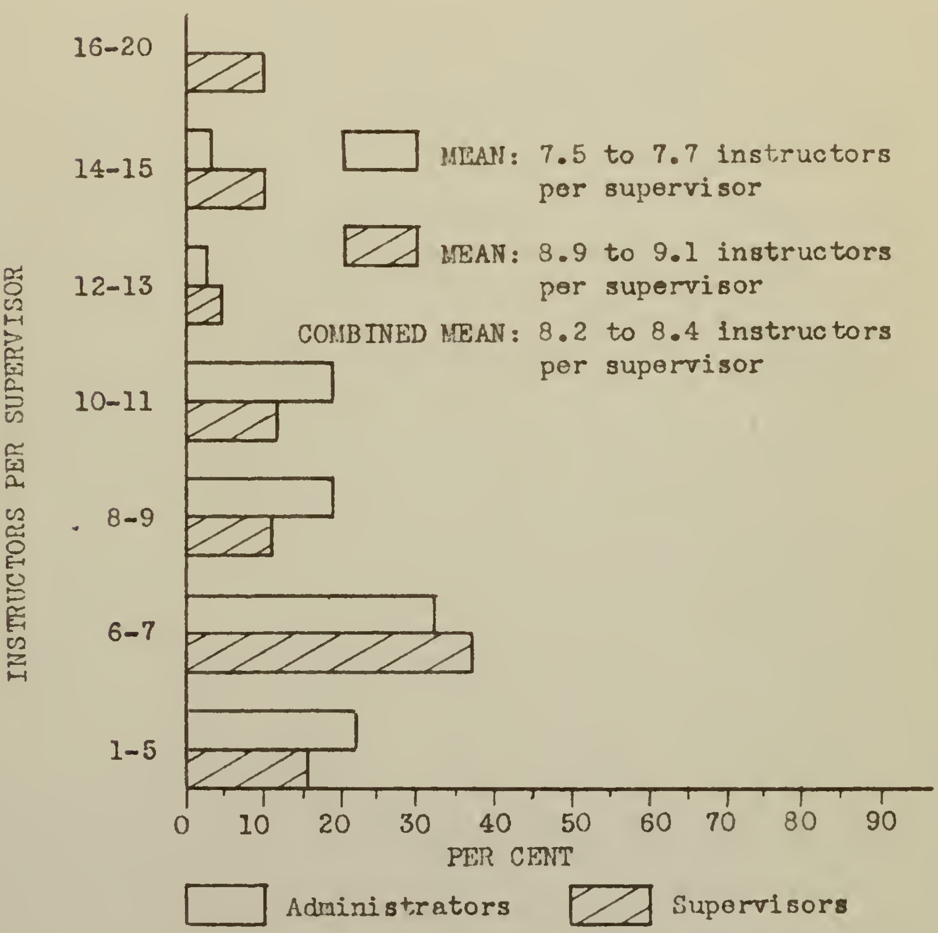

FIGURE 87. OPINIONS OF ADMINISTRATORS AND SUPERVISORS RELATIVE TO THE NUMBER OF INSTRUCTORS THAT SHOULD BE ASSIGNED TO EACH SUPERVISOR

at ten instructors per supervisor as a *maximum*, under average conditions.

Annual Leave

There is little difficulty in reasoning that if all service personnel are entitled to thirty days absence each year with pay, provision must be made for temporary replacement of these personnel. This normally would require additional personnel with a numerical strength of 8.2 percent of the basic instructor and supervisory force. However, since some of this leave of absence is taken during the Christmas holidays when no school is in session, a standard of 8 percent additional personnel should be able to fulfill the requirements.

Sickness and Disciplinary Action

Figures 88 and 89 show the amount of time lost during one year by the instructors and supervisors in Memphis schools due to sickness and disciplinary action. The combined man days lost by these personnel amounts to .94 percent of the total man day potential. This figure is considerably lower than the 4 percent which was tentatively decided upon by the Research Division of the Bureau of Naval Personnel.[1] It is possible that the personnel in that Bureau were using the sickness factor for the overall Navy and not for a specialized group of service school personnel. Because of the undesirable climate and general health conditions in Memphis, it

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[1] *Supra*, p. 161.

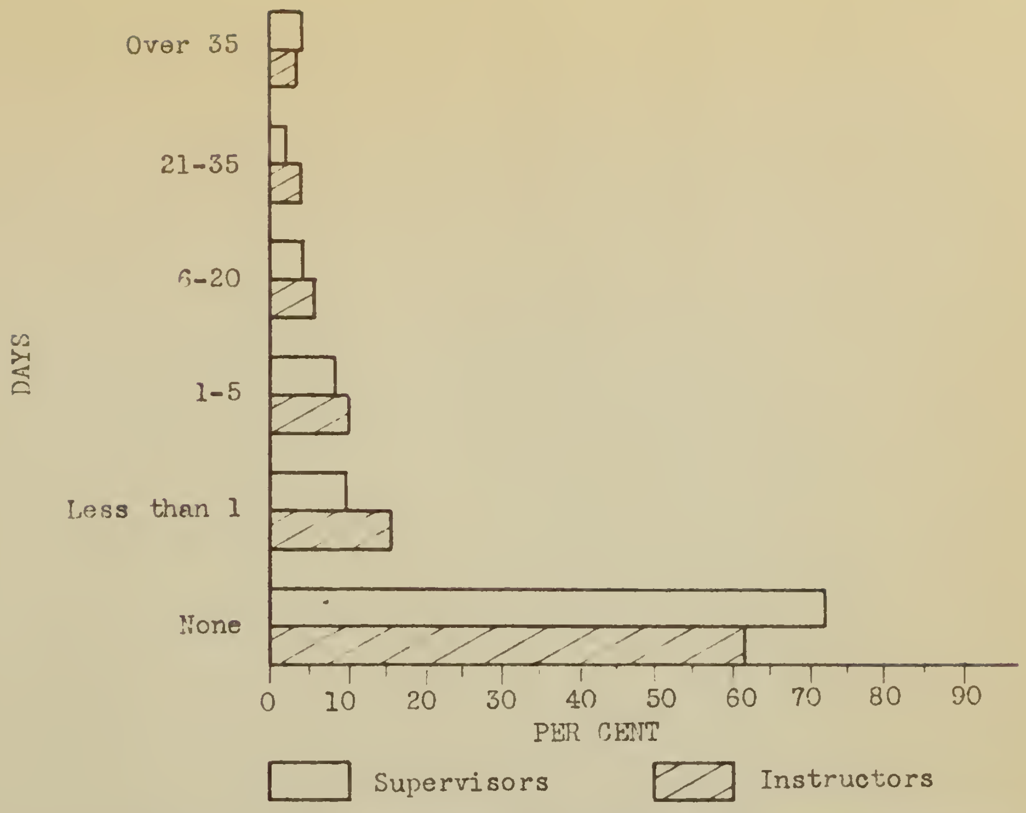

FIGURE 88. SUPERVISORS' AND INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF DAYS LOST BECAUSE OF SICKNESS OR HOSPITALIZATION DURING A TWELVE MONTHS PERIOD

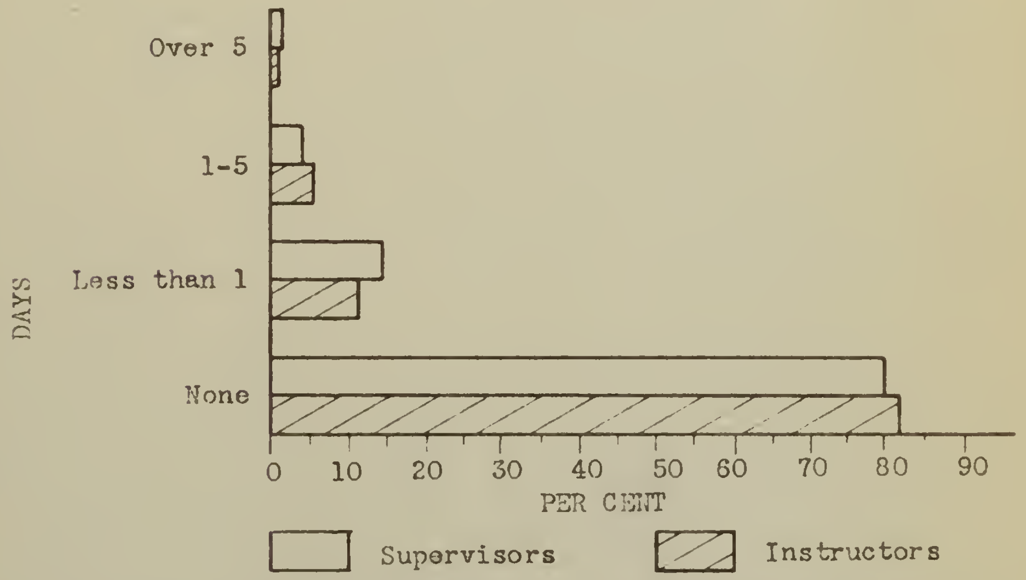

FIGURE 89. SUPERVISORS' AND INSTRUCTORS' RESPONSE TO QUESTION CONCERNING NUMBER OF DAYS LOST BECAUSE OF DISCIPLINARY ACTION DURING A TWELVE MONTHS PERIOD

is not considered that the figure of .94 percent is lower than normally would be expected in any service school.

Benson and Wiley use a figure of 3 percent for contingent unavailables as one of their standards.[1] This figure represents the overall Navy figure of personnel unavailable for duty for various reasons and is not specifically confined to sickness and disciplinary action. Therefore, it cannot be compared with the figure produced by this study.

It seems that sickness and disciplinary action are not in themselves very significant in the instructor problem although a provision for a replacement force of 1 percent should be allowed.

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[1] Ibid., p. 104.

CHAPTER VI

A SOLUTION TO THE PROBLEM

General

It is highly improbable that any simple formula or thumb rule ever can be devised that will take into consideration all of the variables which make up the instructor requirement problem. It seems feasible, however, that since some of the elements of the problem have a mathematical nature and can be measured, some objective method of deriving an estimate or a point of departure can be devised. If some technique which would account for as many of the variables as possible were used in an objective manner, the result of this technique would be a preliminary estimate or point of departure for the application of the remaining variables, which could then be viewed in a subjective manner.

The present general practice of applying a single thumb rule student/instructor ratio to a student load for the determination of the instructors required, is objective in a limited sense, but it certainly accounts for nothing more than the size of the student body. Also, the practice of applying straight percentage increases or decreases in instructor strength to correspond with similar increases or decreases in student strength, makes no attempt to account for any variable but the size of the student body.

The Benson-Wiley system as used in the Naval Air Technical Training Command does account for many of the elements of the problem, however, and although some of the standards used appear to be subject to question and further research, the basic idea of the technique provides an objective approach to the problem. It is therefore described in detail in the following pages.

The Benson-Wiley Technique

The starting point with this system is not the size of the student body, as is the case in most techniques that are used. The first step requires a complete analysis of the course of study. Each phase, unit, and lesson is considered in relation to the number of hours involved, the type of instruction (lecture, lab, shop, etc.) that should be used and the student/instructor ratio that must be employed in the lesson, to provide the most efficient instruction. The results of this analysis are sub-totals of the total course length, expressed in hours and arranged in accordance with the various types of instruction that will be used. The student/instructor ratios that will be used for each unit are also listed at this time. A sample computation sheet is shown in Figure 90. In this example, the total course length of 560 hours is broken down into 371 hours of classroom instruction, 120 hours of shop instruction, and 69 hours of line instruction.

The next step is to arrange these unit breakdowns into the appropriate student/instructor ratio categories. The results here are sub-totals of the total course length,

expressed in hours and arranged according to the various student/instructor ratios that will be used during the course of instruction. A sample computation sheet is given in Figure 91 where it is shown that the course length of 560 hours has now been broken down into 371 hours at a student/instructor ratio of twenty-five to one; eleven hours at a ratio of eight to one; 101 hours at a ratio of six to one; twelve hours at five to one; and sixty-five hours at four to one.

It is then necessary to determine the number of hours which instructors must devote to presentation of the material, which will actually be the instructional hours needed to run the school under the standards and quotas imposed by top management. If this number is then divided by the number of hours of the whole course that a single instructor can handle, the result will be the basic number of instructors required.

For example, if a school has a course of instruction that is ten weeks long, (400 hours), has a student input of ten students once every ten weeks, and each instructor can handle ten students and teach forty hours a week, only one instructor would be required to run the school, providing he never got sick, went on leave, prepared for his classes, built or repaired instructional aids, or lost his motivation for instructor duty. If, however, it is decided that an instructor can only handle five students at a time, the number of instructional hours for the course is doubled and two instructors will be required. If it is then decided that an instructor can teach only twenty hours a week instead of

forty, the number of instructional hours required for the course remains the same, but the number of hours which any one instructor can teach is cut in half and so twice as many instructors will be required, making the total of four. If it is then decided to start a class once every five weeks instead of once every ten weeks, the number of hours which each instructor can devote to the total course length is cut in half again and the number of instructors must be doubled again, making a total of eight. It can be seen that if the total instructional hours in the course are changed, or if the number of instructional hours that one instructor can handle is altered, a resultant change in the number of instructors required will occur.

Denton and Wiley compute the number of instructional hours required by using the formula:

$$\frac{\text{Input Quota x Hours in Course}}{\text{Student/Instructor Ratio}} = \text{Instructor Hours}$$

This formula is applied to each sub-total of course hours until the various student/instructor ratios required have all been accounted for. In Figure 50 it is shown that for 371 course hours at a ratio of twenty-five to one, 371 instructional hours are required. For eleven course hours at a ratio of eight to one, thirty-three instructional hours are required. This procedure is continued for each of the various ratios and the sum of the results is the total number of instructor hours for the course, or 1953 hours in the example given.

At this stage, it might be well to point out that computations are not carried to any decimal figure. Interpretations must be made in each separate organization, keeping in

mind the practical approach that will be taken at the school level in assigning instructors to the course. For instance, if the input quota is twenty-six students and the desirable student/instructor ratio for the first unit of the course is twenty-five students per instructor, the practical approach taken by the school will be to put twenty-six students in the classroom instead of twenty-five. Consequently, in computing the instructional hours required for that unit, it would be incorrect to carry the computation to any fractional value. This is shown in the computations of the sample problem in Figure 92.

Also, it should be pointed out that in the event the input quota is less than the student/instructor ratio acceptable for a particular unit of the course, the minimum number of instructional hours required for that unit will still be the number of course hours in the unit, regardless of the smallness of the input quota. For instance, if in the sample computation, the input quota was only eight students per class, it would still take one instructor to teach the first unit of the course to the class, even though that same instructor could handle twenty-five students just as well. This point was well brought out in the preliminary conclusions reached by the Research Division of the Bureau of Naval Personnel.[1]

It indicates furthermore, that consideration of this fact should be included by top management in planning the size of the student quotas. Frequently, it will be possible

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[1] Supra, pp. 101-2.

to train far more students with the same number of instructors, than the quota actually assigns. The optimum load should be determined in order to gain the greatest amount of return on the instructor investment.

To continue with the technique, determination of the basic instructor requirement is then accomplished by dividing the total instructional hours of the course by the number of instructional hours which each instructor can devote to the course. This is done by use of the formula:

$$\frac{\text{Total Instructional Hours}}{\substack{\text{Input Frequency}\\ \text{(in weeks)}} \times \substack{\text{Standard Instructional}\\ \text{week (in hours)}}} = \substack{\text{Basic number}\\ \text{of instruc-}\\ \text{tors required}}$$

Since Lennon and Wiley used a standard instructional week of thirty hours, and because the frequency of input in the sample problem is weekly, the basic instructor requirement in the sample problem is:

$$\frac{1260}{1 \times 30} = 42$$

Since the supervisory force is to equal ten percent of the number of instructors, an additional four personnel are required, making a total of forty-six in the sample problem. This figure represents the number of instructors and supervisors that would be required to give efficient instruction in the school. They would keep classes going but would have no leave, would not get sick, etc. To this group must be added other personnel, the exact number of which will be determined by the standards which are used. It is to be noted that these additional personnel are not determined as a percentage of the basic instructor and supervisor requirement

AVIATION MACHINIST'S MATE SCHOOL - Class "A" Length: 14 weeks - 560 hours

		Curriculum	Total	CLASS		SHOP		LINE		LAB		FIELD		ETC.
Phase	Unit	Subject	Hours	Hrs	Rto	Hrs	Rto	Hrs	Rto	Hrs	Rto	Hrs	Rto	
I		INTRODUCTION TO ENGINES												
	1	Reciprocating Engines	34	34	25/1									
	2	Engine Familiarization	6	6	25/1									
	3	Aircraft Hardware	24	21	25/1	3	6/1							
II		AIRCRAFT ENGINES												
	1	Wright Engines	40	17	25/1	23	6/1							
	2	Pratt & Whitney Engines	40	20	25/1	20	6/1							
III		A/C POWERPLANT ACCESSORIES												
	1	Ignition Systems	64	55	25/1	9	5/1							
	2	Fuel and Oil Systems	32	32	25/1									
	3	Aircraft Fuel Metering	40	37	25/1	3	5/1							
	4	Aircraft Propellors	40	29	25/1	11	8/1							
IV		AIRCRAFT OPERATIONS												
	1	Line operations	40	19	25/1			21	4/1					
	2	Engine Change	80	28	25/1	48	6/1	4	6/1					
	3	Trouble Shooting	80	36	25/1			44	4/1					
V		JET ENGINES												
	1	Familiarization	7	7	25/1									
	2	Axial Flow Type	33	30	25/1	3	6/1							
TOTALS			560	371		120		69						

FIGURE 90. SAMPLE BREAKDOWN IN HOURS OF COURSE OF STUDY BY TYPE INSTRUCTION AND STUDENT/INSTRUCTOR RATIOS

AVIATION MACHINIST'S MATE SCHOOL - Class "A"

Length: 14 weeks - 560 hours.

	STUDENT - INSTRUCTOR RATIO					
PHASE	25/1	8/1	6/1	5/1	4/1	TOTALS
I	61		3			64
II	37		43			80
III	153	11		12		176
IV	83		52		65	200
V	37		3			40
TOTALS	371	11	101	12	65	560

FIGURE 91. SAMPLE BREAKDOWN IN HOURS OF COURSE OF STUDY BY STUDENT/INSTRUCTOR RATIOS

AVIATION MACHINIST'S MATE SCHOOL - Class "A"

Input: 26 students per week   **Length:** 14 weeks - 560 hours

(a) $$\frac{\text{Input Quota x Hours in Course}}{\text{Student/Instructor Ratio}} = \text{Instructor Hours}$$

$$\frac{\text{26 students x 371 hours}}{\text{25 students/instructor}} = \text{371 instructor hours}$$

$$\frac{26}{8} \text{ x } 11 = 33$$

$$\frac{26}{6} \text{ x } 101 = 404$$

$$\frac{26}{5} \text{ x } 12 = 60$$

$$\frac{26}{4} \text{ x } 65 = \underline{390}$$

(b) Total = 1258 instructor hours

(c) $$\frac{\text{Total Instructor Hours}}{\underset{\text{(in weeks)}}{\text{Input Frequency}} \text{ x } \underset{\text{(standard)}}{\text{Hours/instructional week}}} = \text{BASIC number of instructors required.}$$

$$\frac{\text{1258 instructor hours}}{\text{1 week x 30 hours per week}} = \text{42 instructors}$$

(d) BASIC supervisor force (10 o/o of c) = $\underline{4}$ supervisors

(e) BASIC instructor & supervisor requirements. 46 = 75 o/o of $\underline{\text{"TOTAL"}}$

(f) TOTAL instructor-supervisor requirements = $\frac{46}{.75}$ = $\underline{\underline{\underline{61}}}$

(g) Difference between BASIC and TOTAL

1. Contingent unavailables 9.0 o/o TOTAL = 5
2. Annual Leave 8.2 o/o TOTAL = 5
3. Professional training for replacements (2.8 months) 7.8 o/o TOTAL = 5

DIFFERENCE . . . . 25.0 o/o TOTAL = 15

FIGURE 92. SAMPLE COMPUTATION OF INSTRUCTOR REQUIREMENTS USING THE BENSON-WILEY TECHNIQUE

but rather as a percentage of the basic requirements and the additional personnel combined.

BASIC requirements PLUS Percentage of the TOTAL
IS EQUAL TO THE
TOTAL number of personnel required.

Benson and Wiley used three categories of additional personnel as shown in their standards,[1] and in the sample computation. A discussion of these has already been included in Chapter V. With the addition of this last group to the basic requirements, the total instructor and supervisor force has been computed.

This final figure represents the product of objective measurements. There are many elements of the problem which have not been considered. However, a reasonable reference point has been established and by subjective methods, allowance for the remaining variables may be accomplished. The end result should be a fairly accurate estimate of the instructor requirements for the school in question.

It should be pointed out again that the standards derived by Benson and Wiley have no bearing on the relative value of the technique which they use. The system itself is the important point. It meets the requirement set forth by the Survey Commission which studied the Adjutant General's School[2] in that it correlates with how an instructor uses his time during an ordinary work day or work week. It is

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[1] *Supra*, p. 104.

[2] *Supra*, p. 6-7.

considered to correlate perfectly with the recommendations of the Navy committee which studied factors of special significance influencing the effectiveness of Recruit Training.[1] That committe recommended that new quotas for instructional personnel be based on the amount of time allotted to instruction in each of the learning activities in the areas of the curriculum and the desirable ratio of instructors to recruits in each curricular area, considering the activities therein, as well as the methods of instruction which must be employed. This recommendation is certainly a perfect explanation of the underlying theme in the Benson-Wiley technique.

One of the main advantages of the system is that it is flexible and easily adapted to any school situation. The only requirements which must first be met are the establishment of certain basic standards to fit the school situation concerned. Changes in course length, content of course material, amount and frequency of input, or work standards can be compensated for readily and accurately. The personnel planning section of the Naval Air Technical Training Command keeps a master breakdown of each course of study for the schools in that Command. This breakdown file is kept up to date with latest changes in curriculum construction. Adjustments for changes in input frequency or quantity are made immediately upon receipt from top management. In this manner, an up-to-date estimate of instructor requirements is available

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[1] *Supra*, pp. 99-100.

at all times. In fact, one of the strongest arguments for the system is the fact that this large training command has found it of practical use and made it official policy. If nothing else, it provides a common meeting ground for school level and staff level personnel in the discussion of the problem. Wider use of this technique throughout the armed services would provide a similar medium for discussion on a large scale. It is presented as the best solution to the instructor problem presently available.

CHAPTER VII

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The problem of computing the number of instructors required for a particular service school is composed of many variables. The most significant of these are:

1. The nature and difficulty of the subject material, which determines the number of students per class and has forced service schools to present the material in a manner analogous to the assembly line technique in a modern industrial plant.
2. The length of the course of instruction.
3. The size of the student input since it affects the total size of the student body.
4. The frequency with which new classes are started since it affects the total size of the student body.
5. The background and qualification of the instructor.
6. The formalized instructor training, factory training, and other technical training which an instructor must receive before he can be classified as fully qualified to instruct.
7. The way in which an instructor utilizes his time, which includes time devoted to actual instruction of students, lesson preparation, repair and construction of instructional

aids, extra instruction, revision of the course of study and curriculum, review of student measures, and miscellaneous military duties.

8. The background, qualifications, experience, training, and utilization of the supervisor.
9. Time lost due to sickness, disciplinary action, annual leave, and travel between stations.
10. The length of the instructor duty tour.
11. The characteristics of the school administrator.
12. The abilities and aptitudes for learning possessed by the students.
13. The geographical location of the school plant.
14. The arrangement of the school buildings.
15. The physical capacity of the school rooms.
16. The material condition of the school plant.

Some of the variables are mathematical in nature. They can be measured and approached from an objective point of view in such a manner that certain basic standards can be devised. Standards evolved by this study are:

1. Under average conditions a period of 4.3 weeks should be allowed for indoctrination and phase or unit instruction of a new candidate for instructor duty. This is in addition to formalized instructor training courses such as those given in Instructor Training Schools.
2. Under average conditions, the instructional day should be no longer than five hours in length.
3. Under average conditions, the instructional week should not exceed 21.2 hours, although it is possible that a

twenty-five hour week is permissible providing that at least five of these hours are devoted to laboratory, shop, line, field, or flight instruction.

4. Under average conditions, the class size for lecture instruction should not exceed twenty students.
5. Under average conditions, the class size for laboratory, line, shop, field, or flight instruction should not exceed ten students.
6. Under average conditions, there should be one supervisor for every ten instructors.
7. Under average conditions, a replacement force of instructors equal to eight percent of the total force must be provided to compensate for annual leave.
8. Under average conditions, an additional instructor force equal to one percent of the total force must be provided to compensate for sickness and disciplinary action.

Conclusions

Many of the variables of the instructor requirement problem are incapable of objective measure and must be considered in a subjective manner if they are to be considered in computing instructor requirements.

Any solution to the instructor requirement problem must be based on: (1) the amount of time allotted to instruction in each of the learning activities in the areas of the curriculum and (2) the desirable ratio of instructors to students in each curricular area, considering the activities therein, as well as the methods of instruction which must be employed.

The solution must then account for the remaining variables which the basic approach does not include.

It seems logical to assume that if the objective variables of the problem are combined in a manner to present a preliminary estimate of the instructors required, and if this estimate is used as the point of reference when considering the remaining variables in a subjective manner, the end result should be an accurate determination of the instructional force required.

Although the standards of the Benson-Wiley technique as used by the Naval Air Technical Training Command are subject to question and further research, the system itself appears to meet the requirements of a satisfactory solution to the problem. Substitution of the standards derived by this study in place of those now used in this technique would be a step in the improvement of the system.

There is a need among the services for a solution to this problem and since the Benson-Wiley technique appears to meet the requirements of a satisfactory solution, it should be adopted by top management and school commands that are faced with the problem. Although the standards devised by this study can be used in the technique, new standards should be devised for the individual schools to which the technique is applied. This will involve additional research in the individual schools concerned. Some of the raw data needed for this research already has been obtained in this study, although it would require further analysis.

Any technique that is used will promote greater harmony and cooperation between top management and school level

administrators in that it will provide a common ground for discussion of the problem. As Murphy has pointed out:

> It would seem that the greatest values from the attempts at measuring teacher load by formula or other schemes are two-fold:
>
> 1. They help teachers and administrators to analyze and evaluate the teacher's work, and tend to keep it within reasonable limits. The application of any scheme within the same system or school will equalize the load of teachers and, therefore, correct many abuses.
>
> 2. They serve as means of comparison between schools, whether in the same city, state, or in the nation. Certain standards or norms are arrived at that define a teacher's load in a general way. Examples such as "5 classes of 25 students each plus activities equal to teaching one class" is a very rough standard, but it is a means of comparison with another school whose teachers have "6 classes of 30 students each". Comparisons help administrators to know how their teacher load stands in reference to that of others.[1]

In this respect, it appears that the Benson-Riley technique would permit an analysis of the instructional state of a school. Comparison of the actual number of instructors on board with the number which the technique determined, would be indicative of one or more of three possible conclusions. If the number on board exceeded the number evolved by the technique, possible inefficiencies and poor utilization of instructors might be the answer. If the number on board was less than the number evolved by the technique, improper coverage of the material might be the answer. This in turn might be the result of slipshod instruction, or might even indicate that some portion of the course of study could be shortened or

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[1] Murphy, *op. cit.*, p. 49.

eliminated. The third possible conclusion that could be reached is that the standards used in the technique were in error and needed revision. Regardless, the result would be an analysis of the instructional standard of the school.

Recommendations

In view of the above conclusions, it is therefore recommended that:

1. The Bannon-Riley technique be adopted for service-wide use in computing instructor requirements.
2. That the standards produced by this study be used until additional research produces new standards devised for each individual school concerned.
3. That additional research be conducted in each school to determine the proper standards for this technique.
4. That upon completion of this additional research service schools be analyzed periodically to determine efficiency of instructor utilization and extent of curriculum coverage.

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APPENDIX

FEBRUARY 1950

STUDY OF INSTRUCTOR AND SUPERVISOR LOAD IN TECHNICAL SCHOOLS OF THE NAVAL AIR TECHNICAL TRAINING COMMAND

SCHOOL ADMINISTRATOR QUESTIONNAIRE

INSTRUCTIONS: This questionnaire is to be filled out by School Administrators only. If you are an instructor or a supervisor, please ask the person administering this questionnaire for a copy of the appropriate blank.

The information obtained from this questionnaire will be used in an analysis of the instructor and supervisor load in schools of the Naval Air Technical Training Command. It is hoped that as a result of this analysis, certain teaching standards for service schools will be derived and that a practical yardstick for estimating instructor requirements for any service school will be developed.

The questionnaire has been devised so that you should have ONE answer for each question. All that you have to do is to check the answer which best fits your ideas or opinions, but be sure to check ONLY ONE answer for each numbered question. Please be sure that the answers checked represent YOUR opinion and not that of your shipmate, superior, or subordinate. Your signature, name, service number, and rate are NOT required. There is no need nor will any attempt be made to trace the information on any questionnaire to the individual who filled it out. However, your sincere and earnest cooperation is requested. If you have any comments to make regarding any question, please use the section at the end of the questionnaire. Be sure to identify the question number to which you are referring.

If you have any questions please consult the person administering this questionnaire.

- -

DON'T WRITE IN THIS SPACE

1. To what type of school are you attached?

Machinist	____	Special Devices	____
Structural Mechanic	____	Airman	____
Electrician	____	Mobile Trainers	____
Ordnance	____	Instructor Training	____
Electronics	____	Other	____
Supply	____		

1. 1 7
2 8
3 9
4 10
5 11
6

2. Are you: Enlisted ____ Civilian ____ Officer ____

2. 1 2 3

Check the title below which best represents your position in the school.

In Charge	____	Advisor	____
Ass't to Off. In Charge	____	Phase Officer	____
Training Officer	____	Other	____

3. 1 4
2 5
3 6

4 What is your age?

17-18	____	23-24	____	29-30	____	41-45	____
19-20	____	25-26	____	31-35	____	46-50	____
21-22	____	27-28	____	36-40	____	Over 50	____

4. 1 4 7 10
2 5 8 11
3 6 9 12

5. How many years have you been in federal service?

Less than 3 ____
4 ____
5-6 ____
7-8 ____
9-10 ____
11-12 ____
13-16 ____
17-20 ____
21-24 ____
25-28 ____
28-30 ____
Over 30 ____

5. 1 4 7 10
2 5 8 11
3 6 9 12

6. How much experience have you had as an administrator in school systems? (Include civilian as well as military experience)

Less than 6 months ____
7-12 months ____
13-18 months ____
19-24 months ____
25-30 months ____
31-36 months ____
37-42 months ____
Over 42 months ____

6. 1 5
2 6
3 7
4 8

7. Have you ever had duty as a school teacher or instructor?
Yes ____ No ____

7. 1 2

8. Did you volunteer for, request, or seek duty as a school administrator? Yes ____ No ____

8. 1 2

9. Do you like duty as a school administrator?
Yes ____ No ____ No Opinion ____

9. 1 2 3

THE ANSWER TO THE FOLLOWING QUESTION will depend upon whether or not the course of instruction in your school is taught by "phases" and/or "units". The term "phase" as used here refers to that part of the course of study that is an individual segment in itself. Some instructors may teach a whole phase, or more than one phase. Others may teach only one or two "units" within a phase.

10. In your opinion, what is the AVERAGE number of WEEKS that should be allowed for indoctrination inyour school (include "phase" and "unit" instruction) before an instructor can be classified as "qualified" and put on his own? (Do not include courses in Instructor Training School, Etc).

Phase Instruction is not used ____
None ____
1 week ____
2 weeks ____
3 weeks ____
4 weeks ____
5-6 weeks ____
7-8 weeks ____
9-10 weeks ____
11-12 weeks ____
Over 12 weeks ____

10. 1 5 9
2 6 10
3 7 11
4 8

11. In your opinion, what is the AVERAGE number of HOURS a WEEK that your instructors can actually be in front of their students in a teaching capacity and still do a good job? (In giving this figure, consider continuous instruction week after week, with no weeks off except for regular leave and liberty. Also consider that time will be fairly distributed between classroom and laboratory instruction).

0-5 ____
6-10 ____
11-15 ____
16-20 ____
21-25 ____
26-30 ____
31-35 ____
36-40 ____
41-45 ____

11. 1 4 7
2 5 8
3 6 9

12. In your opinion, what is the MAXIMUM number of HOURS a DAY that an instructor in your school should be required to be in front of his students in a teaching capacity?

1 ____
2 ____
3 ____
4 ____
5 ____
6 ____
7 ____
8 ____

12. 1 3 5 7
2 4 6 8

13. If your instructors are required to conduct any extra instruction in night classes, do you think that any good is accomplished in these classes?

Not required ____ Yes ____ No ____ No Opinion ____

13. 1 2 3 4

14. Do you feel that curriculum and course of study revision and preparation for your school should be performed by:

Instructors ____ All of the above ____
Supervisors ____ Admin. & Supervisors ____
Both of the above ____ None of the above but
Administrators ____ by a separate activity ____

14. 1 5
2 6
3
4 7

IN THE NEXT TWO QUESTIONS, the term "classroom lecture instruction" refers to that type of instruction whereby the instructor explains "theory" or "demonstrates". The term "lab, shop, line, field or flight instruction" refers to that type of instruction wherein the student does the work, (the "practical application") and the instructor merely supervises or directs the effort with instruction being confined to individuals or small groups.

15. In your opinion, what is the MAXIMUM number of students that the instructors in your school could handle in classroom lecture instruction and still do a good job? (Do not consider lab, shop, line, field, or flight instruction, or classroom capacity).

1-5 ____ 16-20 ____ 31-35 ____ 46-50 ____
6-10 ____ 21-25 ____ 36-40 ____ Over 50 ____
11-15 ____ 26-30 ____ 41-45 ____

15. 1 4 7 10
2 5 8 11
3 6 9

16. In your opinion, what is the MAXIMUM number of students that the instructors in your school could handle in lab, shop, line, field, or flight instruction, and still do a good job?

1-5 ____ 16-20 ____ 31-35 ____ 46-50 ____
6-10 ____ 21-25 ____ 36-40 ____ Over 50 ____
11-15 ____ 26-30 ____ 41-45 ____

16. 1 4 7 10
2 5 8 11
3 6 9

Do you feel that the average student in your school is sufficiently qualified to learn everything offered by the course of instruction in your school?

Yes ____ No ____ No Opinion ____

17. 1 2 3

Do you feel that the SUPERVISOR is a necessary billet in your school?

Yes ____ No ____ No Opinion ____

18. 1 2 3

9. In your opinion, how many instructors can the supervisors in your school supervise, and still perform all of their various tasks in a satisfactory manner? (Give an AVERAGE figure).

5 or less ____ 10-11 ____ 16-20 ____ 31-35 ____
6-7 ____ 12-13 ____ 21-25 ____ 36-40 ____
8-9 ____ 14-15 ____ 26-30 ____ Over 40 ____

19. 1 4 7 10
2 5 8 11
3 6 9 12

20. Check the statement below which best represents your opinion.

Supervisors should devote their total time to the supervision of other instructors and should not be required to do any actual instructing except as demonstrations or in emergencies. ______________________ 20. 1

Supervisors should have regular instruction duties in addition to their supervisory duties although the number of classes they handle should be less than that for regular instructors. ______________________ 2

Neither of the above statements represents my opinion. _______ 3

21. Check the statement below which best represents your opinion.

Supervisors should devote the majority of their supervisory time to qualified instructors who are receptive to their suggestions in the hope that the weaker instructors will benefit indirectly and be inspired by observing the results the more qualified instructors are obtaining. ________ 21. 1

Supervisors should devote the majority of their time to the weaker instructors, even though they may not be too receptive to suggestions. ___________ 2

Neither of the above statements represents my opinion. ______ 3

22. to 33. CHECK THE ITEMS BELOW which you think represent the MINIMUM qualifications for instructor duty in your school at this time.

22. High School Grad ____ 22. 1 2
23. Some College ____ 23. 1 2
24. College Grad ____ 24. 1 2

25. Civilian Teacher ____ 25. 1 2
26. Class P School Grad ____ 26. 1 2
27. Class A School Grad ____ 27. 1 2

28. Class B or C School Grad ____ 28. 1 2
29. Factory Training ____ 29. 1 2
30. Less than 2 years fleet duty ____ 30. 1 2

31. More than 2 years fleet duty ____ 31. 1 2
32. Less than 2 years ashore in non-training duty ____ 32. 1 2
33. More than 2 years ashore in non-training duty ____ 33. 1 2

34. Do you feel that formalized instructor training such as that given in Instructor Training School is necessary before the average candidate can qualify for an assignment as an instructor?

Yes ____ No Opinion ____ 34. 1 3
No ____ Not necessary but desirable ____ 2 4

35. Do you feel that formalized supervisor training such as that given in the Supervisor Training Course is necessary before the average candidate can qualify for an assignment as a supervisor?

Yes ____ No Opinion ____ 35. 1 3
No ____ Not necessary but desirable ____ 2 4

36. Is sickness and hospitalization of instructors and supervisors a noticeable problem in your school?

Yes ____ No ____ No Opinion ____ 36. 1 2 3

37. Is lost instructor or supervisor time due to disciplinary action, AWOL, AOL, etc. a noticeable problem in your school?

Yes ____ No ____ No Opinion ____ 37. 1 2 3

38. Do you feel that an instructor in your school could teach for 30 HOURS and attend phase or unit instruction for another 10 HOURS during the same WEEK and still do a good job as an instructor?

Yes ____ No ____ No Opinion ____ 38. 1 2 3

(SEE NEXT PAGE)

List here, the reasons for your answer to the LAST question.

Please use the space BELOW for any comments which you wish to make concerning questions previously answered. Be sure to give the number of the question to which you are referring. Use the other side of the sheet if necessary.

QUESTION #____

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

FEBRUARY 1950

STUDY OF INSTRUCTOR AND SUPERVISOR LOAD IN TECHNICAL SCHOOLS OF THE NAVAL AIR TECHNICAL TRAINING COMMAND

SUPERVISOR QUESTIONNAIRE

INSTRUCTIONS: This questionnaire is to be filled out by Supervisors only. If you are an instructor or a school administrator, please ask the person administering this questionnaire for a copy of the appropriate blank.

The information obtained from this questionnaire will be used in an analysis of the instructor and supervisor load in schools of the Naval Air Technical Training Command. It is hoped that as a result of this analysis, certain teaching standards for service schools will be derived and that a practical yardstick for estimating instructor requirements for any service school will be developed.

The questionnaire has been devised so that you should have ONE answer for each question. All that you have to do is to check the answer which best fits your ideas or opinions, but be sure to check ONLY ONE answer for each numbered question. Please be sure that the answers checked represent YOUR opinion and not that of your shipmate, superior, or subordinate. Your signature, name, service number, and rate are NOT required. There is no need nor will any attempt be made to trace the information on any questionnaire to the individual who filled it out. However, your sincere and earnest cooperation is requested. If you have any comments to make regarding any question, please use the section at the end of the questionnaire. Be sure to identify the question number to which you are referring.

If you have any questions please consult the person administering this questionnaire.

- -

DON'T WRITE IN THIS SPACE

1. To what type of school are you attached?

Machinist	____	Special Devices	____	1.	1	7
Structural Mechanic	____	Airman	____		2	8
Electrician	____	Mobile Trainers	____		3	9
Ordnance	____	Instructor Training	____		4	10
Electronics	____	Other	____		5	11
Supply	____				6	

Are you: Enlisted ____ Civilian ____ Officer ____ — 2. 1 2 3

If enlisted, what is your pay grade?

Not enlisted	____	1st Class	____	3rd Class	____	3.	1	3	5
CPO	____	2nd Class	____	Below 3rd Class	____		2	4	6

4. What is your age?

17-18	____	23-24	____	29-30	____	41-45	____	4.	1	4	7	10
19-20	____	25-26	____	31-35	____	46-50	____		2	5	8	11
21-22	____	27-28	____	36-40	____	Over 50	____		3	6	9	12

5. Are you married? Yes ____ No ____ — 5. 1 2

6. How many dependents do you have?

None ____ 3 ____ 6 ____
1 ____ 4 ____ 7 ____
2 ____ 5 ____ More than 7 ____

6. 1 4 7
2 5 8
3 6 9

7. How many years have you been in federal service?

Less than 3 ____ 7-8 ____ 13-16 ____ 25-28 ____
4 ____ 9-10 ____ 17-20 ____ 28-30 ____
5-6 ____ 11-12 ____ 21-24 ____ Over 30 ____

7. 1 4 7 10
2 5 8 11
3 6 9 12

8. How long have you been a supervisor? (Include civilian as well as military experience).

Less than 6 months ____ 25-30 months ____
7-12 months ____ 31-36 months ____
13-18 months ____ 37-42 months ____
19-24 months ____ Over 42 months ____

8. 1 5
2 6
3 7
4 8

9. Did you volunteer for or request instructor duty?

Yes ____ No ____

9. 1 2

10. How long were you an instructor before you became a supervisor? (Include all past formalized teaching experience, civilian as well as military).

Never ____ 13-18 months ____ 31-36 mos. ____
Less than 6 months ____ 19-24 months ____ Over 36 mos. ____
7-12 months ____ 25-30 months ____

10. 1 4 7
2 5 8
3 6

11. In your opinion, how long should a tour of instructor and/or supervisor duty last?

No Opinion ____ 13-18 months ____ 31-36 mos. ____
Less than 6 months ____ 19-24 months ____ Over 36 mos. ____
7-12 months ____ 25-30 months ____

11. 1 4 7
2 5 8
3 6

12. Did you like duty as an instructor?

Yes ____ No Opinion ____
No ____ Liked it for awhile but got bored ____

12. 1 3
2 4

13. Do you like duty as a supervisor?

Yes ____ No Opinion ____
No ____ Liked it for awhile but I'm bored now ____

13. 1 3
2 4

If your answer to the above question is other than YES, would you like supervisor duty if it were under different conditions at another station?

Answered YES in #13 ____ Yes ____
No Opinion ____ No ____

14. 1 3
2 4

THE ANSWER TO THE FOLLOWING QUESTION will depend upon whether or not the course of instruction in your school is taught by "phases" and/or "units". The term "phase" as used here refers to that part of the course of study that is an individual segment in itself. Some instructors may teach a whole phase, or more than one phase. Others may teach only one or two "units" within a phase.

In your opinion, what is the AVERAGE number of WEEKS that should be allowed for indoctrination in your school (include "phase" and "unit" instruction) before an instructor can be classified as "qualified" and put on his own? (Do not include courses in Instructor Training School, Etc.)

Phase Instruction is not used	____	3 weeks	____	9-10 weeks	____	15.	1	5	9
None	____	4 weeks	____	11-12 weeks	____		2	6	10
1 week	____	5-6 weeks	____	Over 12 weeks	____		3	7	11
2 weeks	____	7-8 weeks	____				4	8	

16. In your opinion, what is the AVERAGE number of HOURS a WEEK that your instructors can actually be in front of their students in a teaching capacity and still do a good job? (In giving this figure, consider continuous instruction week after week, with no weeks off except for regular leave and liberty. Also consider that time will be fairly distributed between classroom and laboratory instruction).

0-5	____	16-20	____	31-35	____	16.	1	4	7
6-10	____	21-25	____	36-40	____		2	5	8
11-15	____	26-30	____	41-45	____		3	6	9

17. In your opinion, what is the MAXIMUM number of HOURS a DAY that an instructor in your school should be required to be in front of his students in a teaching capacity?

1	____	3	____	5	____	7	____	17.	1	3	5	7
2	____	4	____	6	____	8	____		2	4	6	8

If your instructors are required to conduct any extra instruction in night classes, do you think that any good is accomplished in these classes?

Yes ____ No ____ No Opinion ____ 18. 1 2 3

If you have to assist in the preparation or revision of the curriculum or course of study for your school, how many DAYS have you devoted to such work in the LAST SIX (6) MONTHS?

Don't Assist	____	11-15	____	31-60	____	19.	1	4	7
1-5	____	16-20	____	61-90	____		2	5	8
6-10	____	21-30	____	Over 90	____		3	6	9

20. If you do any instructing in addition to your supervisory duties, what is the AVERAGE number of HOURS a WEEK during which you are actually engaged in teaching your students? (In computing this figure, consider any weeks when you have no class as ZERO hours of instruction and average this figure in with others. For instance, a man might teach 40 hours one week, 20 the next, and then have a week off. His AVERAGE per week would be 40 plus 20 plus ZERO divided by 3, or 20 hours).

Don't instruct ____ 11-15 ____ 26-30 ____
0-5 ____ 16-20 ____ 31-35 ____
6-10 ____ 21-25 ____ 36-40 ____

20. 1 4 7
2 5 8
3 6 9

21. How many instructors are you required to supervise?

5 or less ____ 10-11 ____ 16-20 ____ 31-35 ____
6-7 ____ 12-13 ____ 21-25 ____ 36-40 ____
8-9 ____ 14-15 ____ 26-30 ____ Over 40 ____

21. 1 4 7 10
2 5 8 11
3 6 9 12

22. How many instructors do you feel that you can adequately supervise and still perform all of your various tasks in a satisfactory manner?

5 or less ____ 10-11 ____ 16-20 ____ 31-35 ____
6-7 ____ 12-13 ____ 21-25 ____ 36-40 ____
8-9 ____ 14-15 ____ 26-30 ____ Over 40 ____

22. 1 4 7 10
2 5 8 11
3 6 9 12

IN THE NEXT TWO QUESTIONS, the term"classroom lecture instruction" refers to that type of instruction whereby the instructor explains "theory" or "demonstrates". The term "lab, shop, line, field, or flight instruction" refers to that type of instruction wherein the student does the work, (the "practical application") and the instructor merely supervises or directs the effort with instruction being confined to individuals or small groups.

23. In your opinion, what is the MAXIMUM number of students that the instructors in your school could handle in classroom lecture instruction and still do a good job? (Do not consider lab, shop, line, field, or flight instruction, or classroom capacity).

1-5 ____ 16-20 ____ 31-35 ____ 46-50 ____
6-10 ____ 21-25 ____ 36-40 ____ Over 50 ____
11-15 ____ 26-30 ____ 41-45 ____

23. 1 4 7 10
2 5 8 11
3 6 9

In your opinion, what is the MAXIMUM number of students that the instructorsin your school could handle in lab, shop, line, field, or flight instruction, and still do a good job?

1-5 ____ 16-20 ____ 31-35 ____ 46-50 ____
6-10 ____ 21-25 ____ 36-40 ____ Over 50 ____
11-15 ____ 26-30 ____ 41-45 ____

24. 1 4 7 10
2 5 8 11
3 6 9

25. Do you feel that the average student in your school is sufficiently qualified to learn everything offered by the course of instruction in your school?

Yes ____ No ____ No Opinion ____

25. 1 2 3

26. Check the statement below which best represents your opinion.

Supervisors should devote their total time to the supervision of other instructors and should not be required to do any actual instructing except as demonstrations or in emergencies. ________ 26. 1

Supervisors should have regular instruction duties in addition to their supervisory duties although the number of classes they handle should be less than that for regular instructors. ________ 2

Neither of the above statements represents my opinion. ____ 3

27. Check the statement below which best represents your opinion.

Supervisors should devote the majority of their supervisory time to qualified instructors who are receptive to their suggestions in the hope that the weaker instructors will benefit indirectly and be inspired by observing the results the more qualified instructors are obtaining. ____ 27. 1

Supervisors should devote the majority of their time to the weaker instructors, even though they may not be too receptive to suggestions. ____ 2

Neither of the above statements represents my opinion. ____ 3

28. to 39. CHECK THE ITEMS BELOW which best describe your past career.

28. High School Grad ____ 28. 1 2
29. Some College ____ 29. 1 2
30. College Grad ____ 30. 1 2

Civilian Teacher ____ 31. 1 2
Class P School Grad ____ 32. 1 2
33. Class A School Grad ____ 33. 1 2

Class B or C School Grad ____ 34. 1 2
Factory Training ____ 35. 1 2
Less than 2 years fleet duty ____ 36. 1 2

More than 2 years fleet duty ____ 37. 1 2
38. Less than 2 years ashore in non-training duty ____ 38. 1 2
39. More than 2 years ashore in non-training duty ____ 39. 1 2

40. Check the ONE (ONLY ONE) item below that has contributed most to your success as an instructor and/or supervisor. (Do not consider formal Instructor Training-Supervisor Training as this is covered in the next few questions).

High School	____	Class B or C School	____	40.	1	6
College	____	Factory Training	____		2	7
Civilian Teaching	____	Fleet Experience	____		3	8
Class P School	____	Shore duty in non-training billets.	____		4	
Class A School	____				5	9

41. to 45. CHECK BELOW THE TYPES of specialized teacher training that you have received.

41. None ____ 41. 1 2
42. Instructor Training School ____ 42. 1 2
43. Supervisor Training Course ____ 43. 1 2
44. Phase Instruction ____ 44. 1 2
45. Other ____ 45. 1 2

46. If you attended Instructor or Supervisor Training School, do you feel that the training received there contributed more to your success as an instructor and/or supervisor than the item checked in question number 40?
Didn't Attend ____ Yes ____ No ____ No Opinion ____ 46. 1 2 3 4

47. Do you feel that formalized instructor training such as that given in Instructor Training School is necessary before the average candidate can qualify for an assignment as an instructor?
Yes ____ No Opinion ____ 47. 1 3
No ____ Not necessary but desirable ____ 2 4

48. Do you feel that formalized supervisor training such asthat given in the Supervisor Training Course is necessary before the average candidate can qualify for an assignment as a supervisor?
Yes ____ No Opinion ____ 48. 1 3
No ____ Not necessary but desirable ____ 2 4

49. How many DAYS have you been absent from duty during the last 12 MONTHS because of sickness or hospitalization? (Include time lost attending sick call).
None ____ 6-10 ____ 21-25 ____ 36-40 ____ 49. 1 4 7 10
Less than 1 ____ 11-15 ____ 26-30 ____ Over40 ____ 2 5 8 11
1-5 ____ 16-20 ____ 31-35 ____ 3 6 9

50. How many DAYS have you been absent from duty during the past 12 MONTHS because of disciplinary actions in which you were either the defendant or a witness? (Include time lost when attending Captain's Mast, and AOL or AWOL time).
None ____ 1-5 ____ 11-15 ____ 21-25 ____ 50. 1 3 5 7
Less than 1 ____ 6-10 ____ 16-20 ____ Over 25 ____ 2 4 6 8

51. Do you feel that you could teach for 30 HOURS and attend phase or unit instruction for another 10 HOURS during the same week and still do a good job as an instructor?
Yes ____ No ____ No Opinion ____ 51. 1 2 3

(SEE NEXT PAGE)

List here, the reasons for your answer to the LAST question.

Please use the space BELOW for any comments which you wish to make concerning questions previously answered. Be sure to give the number of the question to which you are referring. Use the other side of the sheet if necessary.

QUESTION #____

Last Page

FEBRUARY 1950

STUDY OF INSTRUCTOR AND SUPERVISOR LOAD IN TECHNICAL SCHOOLS OF THE NAVAL AIR TECHNICAL TRAINING COMMAND

INSTRUCTOR QUESTIONNAIRE

INSTRUCTIONS: This questionnaire is to be filled out by Instructors only. If you are a supervisor or a school administrator, please ask the person administering this questionnaire for a copy of the appropriate blank. If you have just recently reported for Instructor Duty and have not yet been qualified to take over on your own, you will not be required to complete any questionnaire.

The information obtained from this questionnaire will be used in an analysis of theinstructor and supervisor load in schools of the Naval Air Technical Training Command. It is hoped that as a result of this analysis, certain teaching standards for service schools will be derived and that a practical yardstick for estimating instructor requirements for any service school will be developed.

The questionnaire has been devised so that you should have ONE answer for each question. All that you have to do is to check the answer which best fits your ideas or opinions, but be sure to check ONLY ONE answer for each numbered question. Please be sure that the answers checked represent YOUR opinion and not that of your shipmate, superior, or subordinate. Your signature, name, service number, and rate are NOT required. There is no need nor will any attempt be made to trace the information on any questionnaire to the individual who filled it out. However, your sincere and earnest cooperation is requested. If you have any comments to make regarding any question, please use the section at the end of the questionnaire. Be sure to identify the question number to which you are referring.

If you have any questions please consult the person administering this questionnaire.

- -

DON'T WRITE IN THIS SPACE

1. To what type of school are you attached?

Machinist ____
Structural Mechanic ____
Electrician ____
Ordnance ____
Electronics ____
Supply ____
Special Devices ____
Airman ____
Mobile Trainers ____
Instructor Training ____
Other ____

1. 1 7
2 8
3 9
4 10
5 11
6

2. Are you: Enlisted ____ Civilian ____ Officer ____

2. 1 2 3

3. If enlisted, what is your pay grade?

Not enlisted ____
CPO ____
1st Class ____
2nd Class ____
3rd Class ____
Below 3rd Class ____

3. 1 3 5
2 4 6

4. What is your age?

17-18 ____
19-20 ____
21-22 ____
23-24 ____
25-26 ____
27-28 ____
29-30 ____
31-35 ____
36-40 ____
41-45 ____
46-50 ____
Over 50 ____

4. 1 4 7 10
2 5 8 11
3 6 9 12

5. Are you married? Yes ____ No ____

5. 1 2

6. How many dependents do you have?

None ____ 3 ____ 6 ____
1 ____ 4 ____ 7 ____
2 ____ 5 ____ More than 7 ____

6. 1 4 7
2 5 8
3 6 9

7. How many years have you been in federal service?

Less than 1 ____ 3 ____ 7-8 ____ 13-16 ____
1 ____ 4 ____ 9-10 ____ 17-20 ____
2 ____ 5-6 ____ 11-12 ____ Over 20 ____

7. 1 4 7 10
2 5 8 11
3 6 9 12

8. How long have you been an instructor? (Include all your past formalized teaching experience, civilian as well as military).

Less than 6 months ____ 25-30 months ____
7-12 months ____ 31-36 months ____
13-18 months ____ 37-42 months ____
19-24 months ____ over 42 months ____

8. 1 5
2 6
3 7
4 8

9. How long have you been an instructor in this present tour of duty?

Less than 6 months ____ 25-30 months ____
7-12 months ____ 31-36 months ____
13-18 months ____ 37-42 months ____
19-24 months ____ Over 42 months ____

9. 1 5
2 6
3 7
4 8

10. Did you volunteer for or request instructor duty?

Yes ____ No ____

10. 1 2

11. In your opinion, how long should a tour of instructor and/or supervisor duty last?

No Opinion ____ 13-18 months ____ 31-36 months ____
Less than 6 months ____ 19-24 months ____ 36-42 months ____
7-12 months ____ 25-30 months ____ Over 42 mos. ____

11. 1 4 7
2 5 8
3 6 9

12. Do you like instructor duty?

Yes ____ No Opinion ____
No ____ Liked it for awhile but I'm bored now ____

12. 1 3
2 4

13. If your answer to the above question is other than YES, would you like instructor duty if it were under different conditions at another station?

Answered YES in # 12. ____ Yes ____
No Opinion ____ No ____

13. 1 3
2 4

THE ANSWER TO THE NEXT FEW QUESTIONS will depend upon whether or not the course of instruction in your school is taught by "phases" and/or "units". The term "phase" as used here refers to that part of the course of study that is an individual segment in itself. Some instructors may teach a whole phase, or more than one phase. Others may teach only one or two "units" within a phase.

14. How many PHASES do you teach?
Phase Instruction
is not used ____ 3 ____ 7 ____
Less than 1 ____ 4 ____ 8 ____
1 ____ 5 ____ 9 ____
2 ____ 6 ____ Over 9 ____

14. 1 5 9
2 6 10
3 7 11
4 8 12

15 hat is the number of DAYS required to complete the LONGEST hase or unit that you teach?
Phase Instruction
is not used ____ 2-4 ____ 11-15 ____ 26-30 ____
Less than 1 ____ 5-6 ____ 16-20 ____ 31-35 ____
1 ____ 7-10 ____ 21-25 ____ Over 35 ____

15. 1 4 7 [illegible]
2 5 8 [illegible]
3 6 9 [illegible]

hat is the number of DAYS required to complete the SHORTEST hase or unit that you teach?
Phase Instruction
is not used ____ 2-4 ____ 11-15 ____ 26-30 ____
Less than 1 ____ 5-6 ____ 16-20 ____ 31-35 ____
1 ____ 7-10 ____ 21-25 ____ Over 35 ____

16. 1 4 7 10
2 5 8 11
3 6 9 12

fter you reported for instructor duty on this tour, how long ere you required to attend phase or unit instruction as a student or as an assistant to a regular instructor, before you ere actually considered fully qualified and allowed to take er on your own? (Do not include courses in Instructor raining School).
Phase Instruction
is not used ____ 3 weeks ____ 9-10 weeks ____
None ____ 4 weeks ____ 11-12 weeks ____
1 week ____ 5-6 weeks ____ Over 12 weeks ____
2 weeks ____ 7-8 weeks ____

17. 1 5 9
2 6 10
3 7 11
4 8

8 In your opinion, what is the AVERAGE number of WEEKS that should be allowed for indoctrination in your school (include "phase" and "unit" instruction) before an instructor can be classified as qualified and put on his own? (Do not include courses in Instructor Training School, Etc.)
Phase instruction
is not used ____ 3 weeks ____ 9-10 weeks ____
None ____ 4 weeks ____ 11-12 weeks ____
1 week ____ 5-6 weeks ____ Over 12 weeks ____
2 weeks ____ 7-8 weeks ____

18. 1 5 9
2 6 10
3 7 11
4 8

9. Are you rotated from one phase or unit to another as you become qualified to teach a different phase or unit?
Phase instruction not used ____ Yes ____ No ____

19. 1 2 3

If you are presently attending phase or unit instruction (in addition to your regular teaching duties) in order to qualify for teaching duty in a new phase or unit, how many HOURS a WEEK do you spend attending such instruction?
Phase Instruction
not used ____ 3-4 ____ 11-12 ____
Not attending phase ____ 5-6 ____ 13-16 ____
instruction ____ 7-8 ____ 17-20 ____
1-2 ____ 9-10 ____ Over 20 ____

20. 1 4 8
5 9
2 6 10
3 7 11

21. Are you bored with any of the phases or units that you are now teaching?
Phase instruction not used ____ Yes ____ No ____ No Opinion ____

21. 1 2 3 4

22. What is the MAXIMUM number of HOURS a DAY that you are actually engaged in teaching your students? (Do not consider extra instruction in night classes).
1 ____ 4 ____ 7 ____
2 ____ 5 ____ 8 ____
3 ____ 6 ____ Over 8 ____

22. 1 4 7
2 5 8
3 6 9

What is the MINIMUM number of HOURS a DAY that you are actually engaged in teaching your students?
None ____ 3 ____ 6 ____ Over 8 ____
1 ____ 4 ____ 7 ____
2 ____ 5 ____ 8 ____

23. 1 4 7 10
2 5 8
3 6 9

How many DAYS a WEEK do you have classes? (Give an AVERAGE figure).
1 ____ 3 ____ 5 ____
2 ____ 4 ____ 6 ____

24. 1 3 5
2 4 6

25 If there are times when you are assigned to regular instructor duty and do not have a class for periods of a week or longer, how frequently does this occur?
Never ____ 3 wks on; 2 wks off ____
week on; week off ____ 4 wks on; 1 wk off ____
week on; 2 wks off ____ 4 wks on; 2 wks off ____
2 wks on; week off ____ 5 wks on; 1 wk off ____
2 wks on; 2 wks off ____ 5 wks on; 2 wks off ____
3 wks on; 1 week off ____ Other ratio ____

25. 1 7
2 8
3 9
4 10
5 11
6 12

26 What is the AVERAGE number of HOURS a WEEK during which you are actually engaged in teaching your students? (In computing this figure, consider any weeks when you have no class as ZERO hours of instruction and average this figure in with others. For instance, a man might teach 40 hours one week, 20 the next, and then have a week off. His AVERAGE per week would be 40 plus 20 plus ZERO divided by 3, or 20 hours).
0-5 ____ 16-20 ____ 31-35 ____
6-10 ____ 21-25 ____ 36-40 ____
11-15 ____ 26-30 ____ Over 40 ____

26. 1 4 7
2 5 8
3 6 9

27. How many HOURS a DAY do you feel that you could do the type of instructing you are now performing, and still do a good job? (Give a MAXIMUM figure).
1 ____ 3 ____ 5 ____ 7 ____
2 ____ 4 ____ 6 ____ 8 ____

27. 1 3 5 7
2 4 6 8

28. How many HOURS a WEEK do you feel that you could do the type of instructing you are now performing, and still do a good job? (Give a MAXIMUM figure).

0-5 ____ 16-20 ____ 31-35 ____
6-10 ____ 21-25 ____ 36-40 ____
11-15 ____ 26-30 ____ Over 40 ____

28. 1 4 7
2 5 8
3 6 9

29. How many nights a WEEK do you have night classes?

Occasionally ____ 2 ____ 5 ____
None ____ 3 ____ 6 ____
1 ____ 4 ____

29. 1 4 7
2 5 8
3 6

30. Do you feel that your night classes accomplish any good?

Yes ____ No ____ No Opinion ____

30. 1 2 3

31. How many HOURS a WEEK do you spend giving extra instruction outside of normal working hours? (Do not include night classes)

None ____ 3-4 ____ 7-8 ____ Over 10 ____
1-2 ____ 5-6 ____ 9-10 ____

31. 1 3 5 7
2 4 6

32. How many HOURS a WEEK do you spend in preparation for your classes?

None ____ 5-6 ____ 11-12 ____ 17-18 ____
1-2 ____ 7-8 ____ 13-14 ____ 19-20 ____
3-4 ____ 9-10 ____ 15-16 ____ Over 20 ____

32. 1 4 7 10
2 5 8 11
3 6 9 12

33. Do you have enough time available fpr preparation?

Yes ____ No ____ No Opinion ____

33. 1 2 3

34. If you have to assist in the preparation or revision of the curriculum or course of study for your school, how many DAYS have you devoted to such work in the last SIX MONTHS?

Don't Assist ____ 11-15 ____ 31-60 ____
1-5 ____ 16-20 ____ 61-90 ____
6-10 ____ 21-30 ____ Over 90 ____

34. 1 4 7
2 5 8
3 6 9

35. How many HOURS A WEEK do you spend repairing instructional equipment and constructing instructional aids? (Give an AVERAGE figure).

None ____ 6-10 ____ 16-20 ____ 26-30 ____
1-5 ____ 11-15 ____ 21-25 ____ Over 30 ____

35. 1 3 5 7
2 4 6 8

36. How many HOURS a WEEK do you spend reviewing students homework? (Give an AVERAGE figure).

None ____ 6-10 ____ 16-20 ____ 26-30 ____
1-5 ____ 11-15 ____ 21-25 ____ Over 30 ____

36. 1 3 5 7
2 4 6 8

37. If you have any duties which are strictly military in nature, such as sentry watches, fire watches, or barracks watches, how many HOURS a WEEK do you devote to such duty?

None ____ 5-8 ____ 13-16 ____ 21-24 ____
1-4 ____ 9-12 ____ 17-20 ____ 25-28 ____

37. 1 3 5 7
2 4 6 8

38. What is your duty-liberty ratio?

1 in 2 ____ 1 in 5 ____ 1 in 8 ____ 1 in 11 ____
1 in 3 ____ 1 in 6 ____ 1 in 9 ____ 1 in 12 ____
1 in 4 ____ 1 in 7 ____ 1 in 10 ____ No duty ____

38. 1 4 7 10
2 5 8 11
3 6 9 12

IN THE NEXT FEW QUESTIONS, the term "classroom lecture instruction" refers to that type of instruction whereby the instructor explains "theory" or "demonstrates". The term "lab, shop, line, field or flight instruction" refers to that type of instruction wherein the student does the work, (the "practical application") and the instructor merely supervises or directs the effort with instruction being confined to individuals or small groups.

What is the MAXIMUM number of students that you teach in classroom lecture instruction? (Do not consider lab, shop, line, field, or flight instruction).

Don't give such instruction ____ 11-15 ____ 26-30 ____ 41-45 ____
1-5 ____ 16-20 ____ 31-35 ____ 46-50 ____
6-10 ____ 21-25 ____ 36-40 ____ Over 50 ____

39. 1 4 7 10
2 5 8 11
3 6 9 12

What is the MINIMUM number of students that you teach in classroom lecture instruction? (Do not consider lab, shop, line, field, or flight instruction).

Don't give such instruction ____ 11-15 ____ 26-30 ____ 41-45 ____
1-5 ____ 16-20 ____ 31-35 ____ 46-50 ____
6-10 ____ 21-25 ____ 36-40 ____ Over 50 ____

40. 1 4 7 10
2 5 8 11
3 6 9 12

41. In your opinion, what is the MAXIMUM number of students that you could teach in classroom lecture instruction and still do a good job? (Do not consider classroom capacity).

1-5 ____ 16-20 ____ 31-35 ____ 46-50 ____
6-10 ____ 21-25 ____ 36-40 ____ Over 50 ____
11-15 ____ 26-30 ____ 41-45 ____

41. 1 4 7 10
2 5 8 11
3 6 9

42. What is the MAXIMUM number of students that you teach in lab, line, shop, field, or flight instruction?

Don't give such instruction ____ 11-15 ____ 26-30 ____ 41-45 ____
1-5 ____ 16-20 ____ 31-35 ____ 46-50 ____
6-10 ____ 21-25 ____ 36-40 ____ Over 50 ____

42. 1 4 7 10
2 5 8 11
3 6 9 12

43. What is the MINIMUM number of students that you teach in lab, shop, line, field, or flight instruction?

Don't give such instruction ____ 11-15 ____ 26-30 ____ 41-45 ____
1-5 ____ 16-20 ____ 31-35 ____ 46-50 ____
6-10 ____ 21-25 ____ 36-40 ____ Over 50 ____

43. 1 4 7 10
2 5 8 11
3 6 9 12

44. In your opinion, what is the MAXIMUM number of students that you could teach in lab, shop, line, field, or flight instruction and still do a good job?

1-5	____	16-20	____	31-35	____	46-50	____		
6-10	____	21-25	____	36-40	____	Over 50	____		
11-15	____	26-30	____	41-45	____				

44. 1 4 7 10
2 5 8 11
3 6 9

45. Do you feel that the average student in your school is sufficiently qualified to learn everything offered by the course of instruction in your school?

Yes ____ No ____ No Opinion ____

45. 1 2 3

46 to 57. CHECK THE ITEMS BELOW which best describe your past career.

46. High School Grad ____ — 46. 1 2
47. Some College ____ — 47. 1 2
48. College Grad ____ — 48. 1 2

49. Civilian Teacher ____ — 49. 1 2
50. Class P School Grad ____ — 50. 1 2
51. Class A School Grad ____ — 51. 1 2

52. Class B or C School Grad ____ — 52. 1 2
53. Factory Training ____ — 53. 1 2
54. Less than 2 years fleet duty ____ — 54. 1 2

55. More than 2 years fleet duty ____ — 55. 1 2
56. Less than 2 years ashore in non-training duty ____ — 56. 1 2
57. More than 2 years ashore in non-training duty ____ — 57. 1 2

58. Check the ONE (ONLY ONE) item below that has contributed most to your success as an instructor. (Do not consider formal Instructor Training as this is covered in the next few questions).

High School	____	Class B or C School	____	1	6
College	____	Factory Training	____	2	7
Civilian Teaching	____	Fleet experience	____	3	8
Class P School	____	Shore duty in non-		4	
Class A School	____	training billets.	____	5	9

58.

59 to 63. CHECK BELOW THE TYPES of specialized teacher training that you have received.

59. None — 59. 1 2
60. Instructor Training School ____ — 60. 1 2
61. Supervisor Training Course ____ — 61. 1 2
62. Phase Instruction ____ — 62. 1 2
63. Other ____ — 63. 1 2

64. If you attended Instructor or Supervisor Training School, do you feel that the training received there contributed more to your success as an instructor than the item checked in question number 58?

Didn't Attend ____ Yes ____ No ____ No Opinion ____

64. 1 2 3 4

65. Do you feel that formalized instructor training such as that given in Instructor Training School is necessary before the average candidate can qualify for an assignment as an instructor?
Yes ____ No Opinion ____ 65. 1 3
No ____ Not necessary but desirable ____ 2 4

66. Do you think that your Supervisor is helpful or of any use to you in improving your teaching ability?
Yes ____ No ____ No Opinion ____ 66. 1 2 3

67. Check the statement below which best represents your opinion.

Supervisors should devote the majority of their supervisory time to qualified instructors who are receptive to their suggestions in the hope that the weaker instructors will benefit indirectly and be inspired by observing the results the more qualified instructors are obtaining. ____ 67. 1

Supervisors should devote the majority of their time to the weaker instructors, even though they may not be too receptive to suggestions. ____ 2

Neither of the above statements represents my opinion. ____ 3

68. How many DAYS have you been absent from duty during the last 12 MONTHS because of sickness or hospitalization? (Include time lost attending sick call).
None ____ 6-10 ____ 21-25 ____ 36-40 ____ 68. 1 4 7 10
Less than 1 ____ 11-15 ____ 26-30 ____ Over 40 ____ 2 5 8 11
1-5 ____ 16-20 ____ 31-35 ____ 3 6 9

69. How many DAYS have you been absent from duty during the past 12 MONTHS because of disciplinary actions in which you were either the defendant or a witness? (Include time lost when attending Captain's Mast, and AOL or AWOL time).
None ____ 1-5 ____ 11-15 ____ 21-25 ____ 69. 1 3 5 7
Less than 1 ____ 6-10 ____ 16-20 ____ Over 25 ____ 2 4 6 8

70. Do you feel that you could teach for 30 HOURS and attend phase or unit instruction for another 10 HOURSduring the same week and still do a good job as an instructor?
Yes ____ No ____ No Opinion ____ 70. 1 2 3

SEE THE NEXT PAGE

List here, the reasons for your answer to the LAST question.

Please use the space BELOW for any comments which you wish to make concerning questions previously answered. Be sure to give the number of the question to which you are referring. Use the other side of the sheet if necessary.

QUESTION #____

Last Page

[illegible]

[illegible]

> [illegible]

[illegible]

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Computation of instructor requirements for any service school.

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